TSG-RAN Working Group 3 meeting #4

R3-99439
(Based on previous R3-99132)
(Based on previous R3-99261)

1-4 June 1999
Warwick, UK

Agenda Item: 7

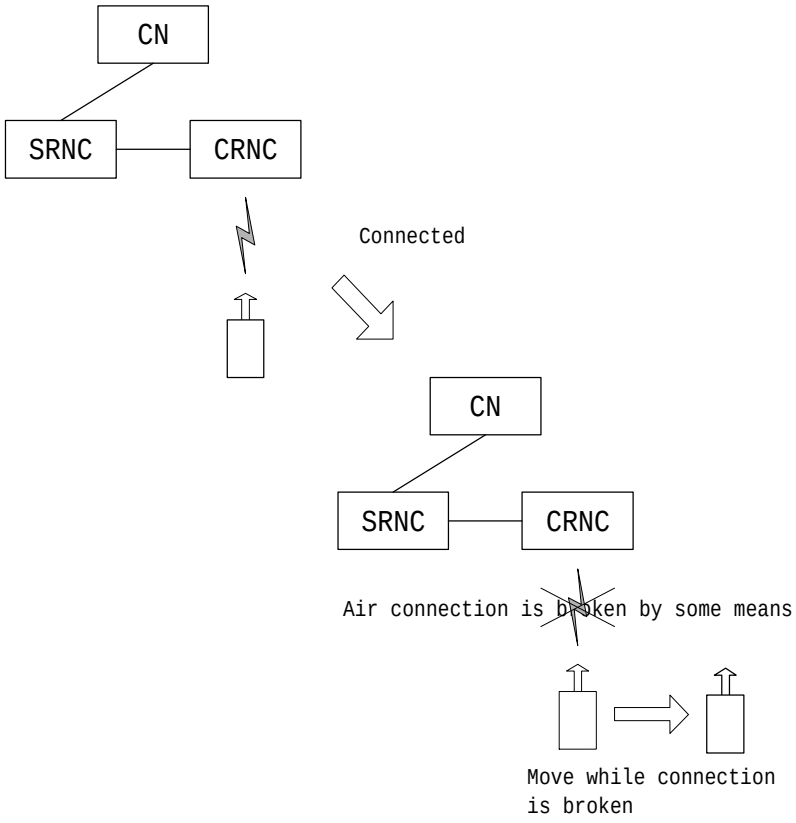
Source: Fujitsu

Title: Proposed RRC Connection Re-establishment Procedure

Abstract : RRC re-establishment procedure was not discussed in the former meetings and relevant contributions were carried over. This contribution proposes the example procedure as a starting point for the discussion.

1. Introduction

The RRC connection re-establishment procedure is now FFS There are two approaches to discuss this procedure. One is the anchor method and the other is SRNC relocation method. Differences between these are shown in figure 1.



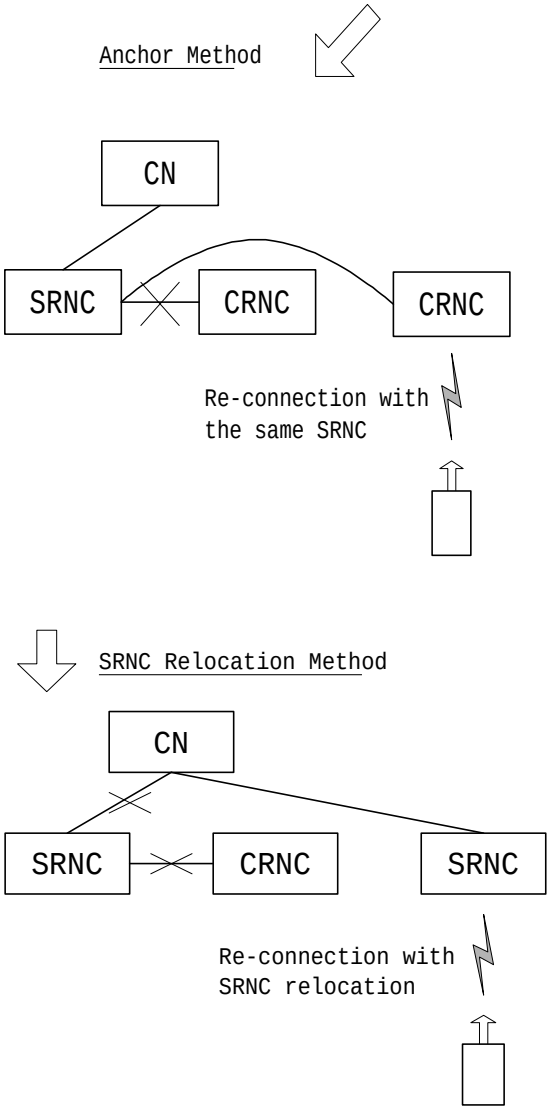


Figure 1 Anchor approach and SRNC relocation approach

In the anchor method, the SRNC before re-establishment is as same as that after re-establishment. But on the contrary, in SRNC relocation method, the SRNC may change when re-establish procedure runs.

Our standpoint is that the both methods should be possible and which to adopt depends on the operator decision.

2. Discussion

The RRC connection re-establishment procedure will need to use the CCCH after the radio connection has been broken.

Figure 2 is the proposed the general elementary procedure for the anchor approach. This assumes a more general case whereby the UE locates at a different RNC before and after the connection has been broken.

Figure 3 is the proposed the general elementary procedure for the anchor approach. This assumes a more general case whereby the UE locates at a different RNC before and after the connection has been broken.

However a UE does not necessarily keep to locate at a different cell. In other cases simpler procedures could be possible. Figure 4 shows the case where the cell is the same. In this case, it may be sufficient only to setup the initial DL power control.

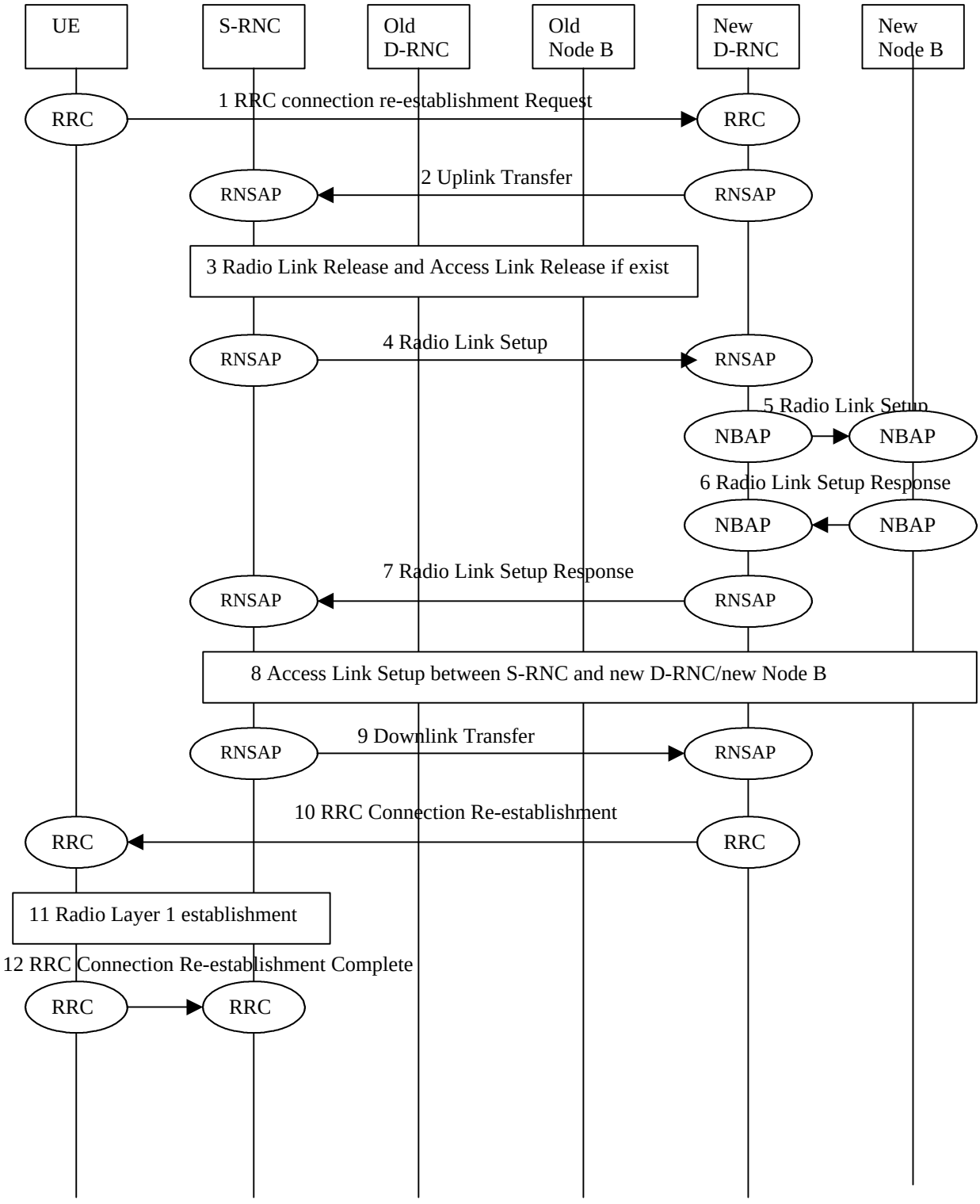


Figure 2. RRC connection Re-establishment (Anchor approach) – DCH Re-establishment

1 The UE initiates the re-establishment of the RRC connection with the new cell by sending **RRC Connection Re-establishment Request** message on CCCH.
Parameters: Old RNTI, Old Cell Id.

2 The new RNC delivers this message transparently as **Uplink Transfer** message to the serving RNC.

3 The SRNC initiates release of Iur/Iub Data Transport bearer using ALCAP protocol and also release of Iur/Iub Radio resource using RNSAP / NBAP protocols.

4 The serving RNC allocates new RNTI and radio resources for the RRC connection on Iur, and sends the RNSAP

message **Radio Link Setup** to the target RNC.

5 The target RNC sends the NBAP message **Radio Link Setup** to the target Node B.

6 Node B allocates resources, and responses with NBAP message **Radio Link Setup Response**.

7 Target RNC responses with RNSAP message **Radio Link Setup Response**.

8 Serving RNC initiates set-up of Iur / Iub Data Transport bearer using ALCAP protocol. This request contains the AAL2 Binding Identity to bind the Iur / Iub Data Transport Bearer to the DCH. The request for set-up of Iur / Iub Data Transport bearer is acknowledged by target RNC / Node B.

9 The serving RNC sends the transparent RNSAP message **Downlink transfer** to the new CRNC.

10 The New CRNC delivers this message as **RRC Connection Re-establishment** message on CCCH.
Parameters: Old RNTI, New RNTI.

11 Radio layer 1 is established.

12 Message **RRC Connection Re-establishment Complete** is sent on the new DCCH from the UE to the serving RNC.

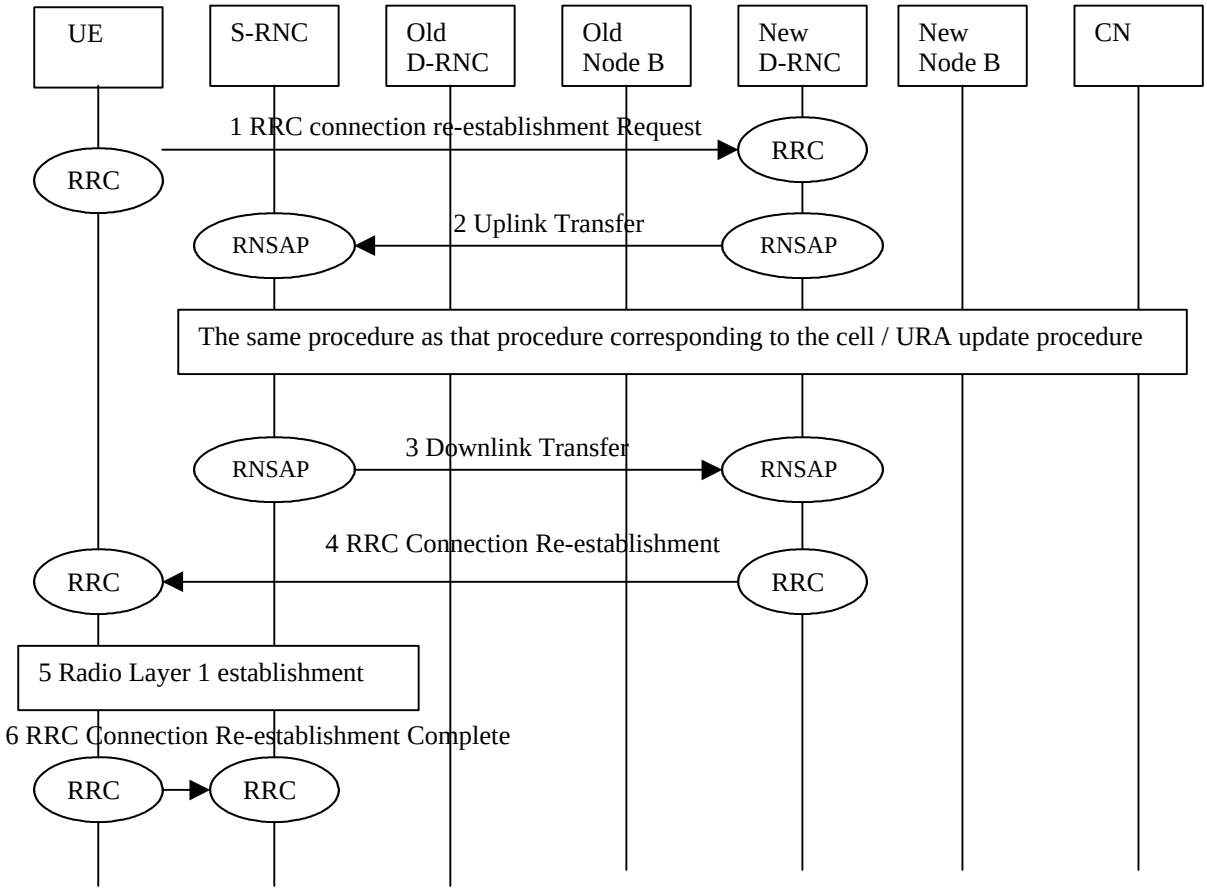


Figure 3. RRC connection Re-establishment (SRNC relocation approach) – DCH Re-establishment

1 The UE initiates the re-establishment of the RRC connection with the new cell by sending **RRC Connection Re-establishment Request** message on CCCH.
Parameters: Old RNTI, Old Cell Id.

2 The new RNC delivers this message transparently as **Uplink Transfer** message to the serving RNC.

Between CCCH transparent transfer, there should be the same procedure which is performed when cell or URA update happens.

3 The serving RNC sends the transparent RNSAP message **Downlink transfer** to the new CRNC.

4 The New CRNC delivers this message as **RRC Connection Re-establishment** message on CCCH.
Parameters: Old RNTI, New RNTI.

5 Radio layer 1 is established.

6 Message **RRC Connection Re-establishment Complete** is sent on the new DCCH from the UE to the serving RNC.

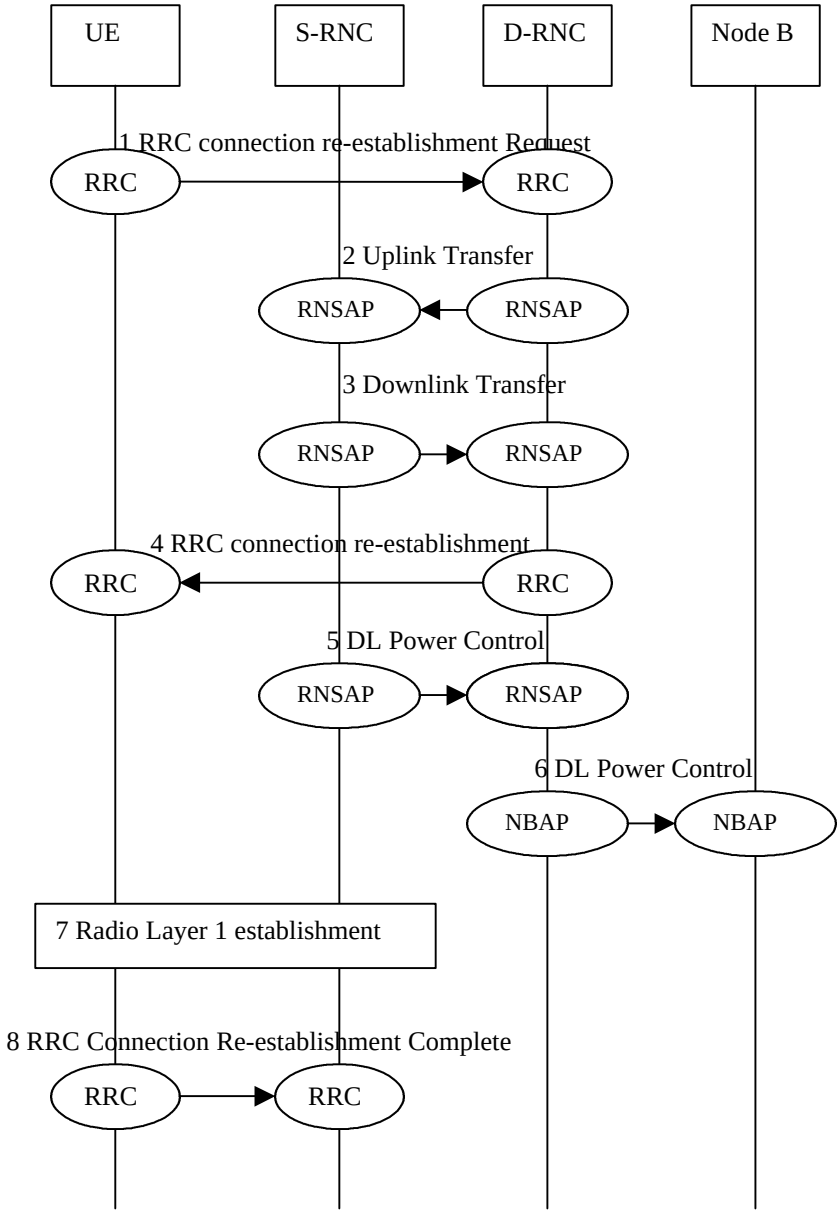


Figure 4 RRC Connection Re-establishment procedure for the case in which the cell is the same.

1 The UE initiates the re-establishment of the RRC connection with the new cell by sending **RRC Connection Re-establishment Request** message on CCCH.
Parameters: Old RNTI, Old Cell Id.
2 The new RNC delivers this message transparently as **Uplink Transfer** message to the serving RNC.
3 The serving RNC sends the transparent RNSAP message **Downlink transfer** to the new CRNC.
4 The New CRNC delivers this message as **RRC Connection Re-establishment** message on CCCH.
Parameters: Old RNTI, New RNTI.
5 SRNC finds the UE still keeps the same cell before the connection break and initiates the DL power control message to DRNC.
6 DRNC delivers the DL power control message to Node B.
7 Radio layer 1 is established.
8 Message **RRC Connection Re-establishment Complete** is sent on the new DCCH from the UE to the serving RNC.

3. Proposal

It is proposed that this contribution should be treated as the starting material for the study of RRC re-establishment procedure.

And figure 2,3 and 4 should be incorporated into specification 25.931 (former I3.01) (UTRAN Functions, Example on Signalling Procedure) of section.9.5.1.