TSG-RAN Working Group2 meeting#6 TSGR2#6(99)840

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Agenda Item: 14.2, RRC mobility related procedures

Source: Motorola

Modifications to RRC required to support mobility of users on the DSCH

1.0 Introduction

This paper deals with the support of user mobility for UE's which are assigned access to the DSCH transport channel. It is recommended that a new elementary procedure 'DSCH Handover' be included in the RRC specification. This procedure enables the network to re-assign the BS from which the DSCH will be transmitted to a given user. In Section 2.0 a list of assumptions are given which were used in the analysis. Section 3.0 describes the processes involved in DSCH handover. Section 4.0 introduces the new elementary procedure. The new RRC messages which are required to support this procedure is described in a companion paper [1].

2.0 Assumptions

1. The transmission of the PDSCH for a given user is transmitted on one of the legs in the associated DCH active set (this is necessary for power control purposes).
2. Currently in 25.212 it is stated that in the DCH/DCH+DSCH state the TFCI will be split into two. One field (field 1) defining the physical layer processing which has been applied on the DSCH and the other field (field 2) defining the physical layer processing applied on the DCH.

3.0 Handover of DSCH

When handing over the DSCH the following actions may/will have to be applied:

1. RRC must indicate the new link (within the active set) from which data on the DSCH will be sent.
2. On handover it is possible that the set of DSCH channelisation code points available for DSCH transmission to a given user may differ between the new DSCH cell and the old DSCH cell. Consequently, when handing over the DSCH it will sometimes be necessary to inform the UE of the new channelisation code mapping. As an example the formula for mapping codes to TFCI (field 1) may be the same in both cells but the root channelisation code may be different (ie. a physical channel reconfiguration).
3. If the data rates available on the DSCH differ between the old cell and the new cell then this could also require a change in the MAC layer processing, as an example the number of transport blocks which can be transferred in a TTI may change (ie. a transport channel reconfiguration).
4. In the event that more than one RNC is involved in the transmission of the associated DCH then only a sub-set of the TFCI(field 1) of the different DPCCH's should be soft-combined at the UE. These DPCCH's will be those transmitted from the BS's under the control of the RNC from which the DSCH is scheduled. If the DSCH handover results in the DSCH being scheduled from a different RNC then the set of DPCCH TFCI(field 1) to be combined would have to be changed, the new 'TFCI combining set' needs to be indicated in an RRC message.

4.0 Modifications required to 25.331 in order to support mobility for users on the DSCH

As a user's channel conditions change the optimum choice of cell from which the DSCH transmissions should be sent may change. There must be a mechanism by which the UE can be notified of the handover and any other changes which it must perform as a result.

There are a number of alternatives by which the handover could be signalled to the UE. The options are:

- Introduce a new elementary procedure - 'DSCH handover'
- Modify existing elementary procedure and messages, possibilities include modifying:
  - Active set update (RRC mobility procedure)
  - Physical channel reconfiguration (RAB control procedure)
  - Transport channel reconfiguration (RAB control procedure)
  - Radio Access Bearer reconfiguration (RAB control procedure)

Since DSCH handover is clearly a mobility related procedure and since none of the current mobility related elementary procedures adequately describe it, it is proposed to introduce a new elementary procedure, 'DSCH handover'.

4.1 New elementary procedure - DSCH handover

It is proposed that the following should be inserted into 25.331 as section 8.3.5.10:

8.3.5.10 DSCH Handover

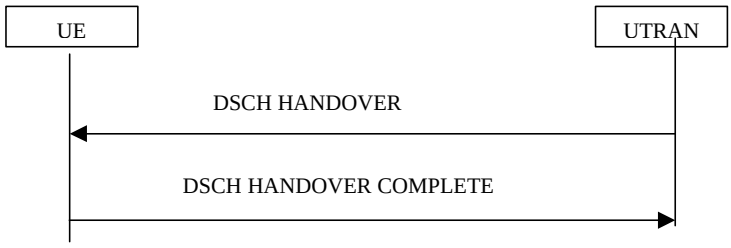

Figure 1) Procedure for DSCH handover

The DSCH HANDOVER message is used to inform the UE that allocations on the DSCH will be transmitted on a new link within the active set. The procedure will in addition notify the UE of any changes in the physical layer mapping of channelisation codes to TFCI(field 1) values as well as any reconfigurations in the MAC layer resulting from the handover. The UTRAN will activate network side reconfigurations on reception of the DSCH HANDOVER COMPLETE message. The RRC messages will be sent on the DCCH mapped onto the associated DCH.

5.0 References

[1] Motorola , TSGR#6(99)839 'Modifications to RRC messages and information elements required to support DSCH'