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Agenda Item: Rel4 issues/ AH22

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Title: Revision of TR25.840 Terminal Power Saving Features introducing UE capability with DPCCH gating

Document for: Discussion and Approval

In the last RAN meeting there was a question raised on the DPCCH gating with respect to the UE capablity and during last WG1 meeting we did not address the topic. It was discussed in RAN that WG1 should formulate the view and then provide that to the other WGs. Thus, we are proposing that UE's capability with gating is optional.

There are two kinds of period in gating depending on the transmission of data on DPDCH during gating. In Basic Gating Period, both DPCCH and DPDCH will contain transmitted bits only in certain slots of the frame. DPDCH is sent in the same slot as DPCCH due to the fact that CRC is attached to zero length transport block to facilitate adequate performance for outer loop power control. If there is no CRC transmitted, i.e., only DPCCH is transmitted, then the outer loop power control target is considered frozen with basic DPCCH only gating . This period is described in section 6.1.4.1. However, even during gating, non-zero length transport block can be transmitted on DPDCH without terminating the gating exceptionally for the data with restricted TFS. This Embedded Data Period is described in section 6.1.4.2.

In addition to this, the network signals to the UE the 'RX gating DRX cycle', which defines in which frames transmission of non-zero length transport block can start again in downlink during gating. The concept of RX gating and parameter 'RX gating DRX cycle' is described in section 6.1.3.

6.1.1 Related Parameters

When the call is setup, UTRAN and UE negotiate the gating capability and parameters. The parameters controlling the gating operation are:

Table 1. Gating Parameters

Gating Rate	1	1/3	1/5
Gating Mode	Downlink Only	Uplink and Downlink	
TFS restrictions in downlink	Tbd		
TFS restrictions in uplink	Tbd		
RX gating DRX cycle	1	2	4
UE's support of gating	Yes/No		

6.1.2 Initiation and Termination Indication of Gated DPCCH Transmission

The gating can be initiated by the UTRAN's command to UE. Gating can be terminated by UE's request followed by UTRAN's permission or by UTRAN's notice to UE. That is, UTRAN determines whether gating is initiated or terminated. Gating is initiated and terminated by higher layer signalling.

6.1.3 RX gating concept

During gating, it is possible for the network to allow battery savings for the UE also from the UE RX side. This is achieved so that network will signal 'RX gating DRX cycle' to the UE with the other gating parameters. If 'RX gating DRX cycle' >1 then it is possible for the UE to turn off the receiver during certain slots in the frames where it is known beforehand that UTRAN is not transmitting neither DPDCH or DPCCH for the UE.

Thus the 'RX gating DRX cycle' defines the cycle, in which frames the transmission of non-zero length transport block can start again during gating.

The definition is that transmission of non-zero length transport block can start again in radio frame CFN, which fulfils both of the two following relations:

a) CFN mod (RX gating DRX cycle) = 0.

b) CFN mod Fi = 0, where Fi is the number of radio frames in one TTI of the TrCHi carrying a non-zero length transport block [TS25.212].