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Title: Interaction between Gated DPCCH Transmission and SSDT

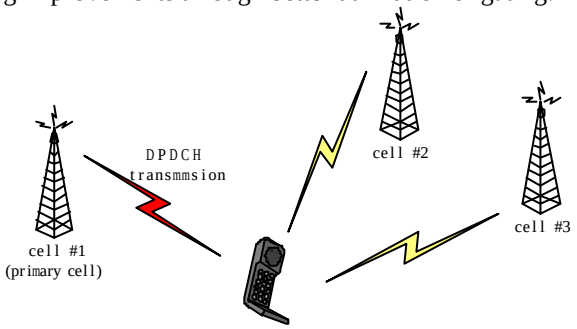
Document for: Discussion and approval

Introduction

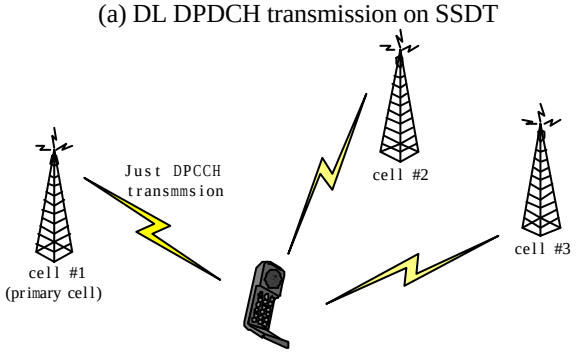
In this contribution, the detailed method for interaction between gating and SSDT is presented. This presentation is showing behavior of UTRAN and UE when gating is initiated or terminated during SSDT is activated, and when SSDT is initiated or terminated during gating is activated.

Two Cases of DL Transmission during SSDT is On

In this section, the relation of SSDT and gating is described. There are 2 cases on SSDT, i.e., the case that DL DPDCH is transmitted and the case that DL DPDCH is not transmitted. Figure 1 (a) shows the case when there is trasmission of DPDCH from primary cell when SSDT is used. In this case, SSDT has no relation to gating since gating cannot be activated in this case. But if there is no DPDCH transmitted during SSDT is activated as shown in figure 1 (b), there is the possibility that gating can be used through some modification of SSDT operation. This contribution is to explain the proposed operation of UTRAN and UE when gating is used in the second case above and to show that there could be UE battery power saving improvements through better utilization of gating.



(a) DL DPDCH transmission on SSDT



(b) No DPDCH transmission on SSDT

Figure 1. Behavior of SSDT depending on existence of DPDCH

Proposed Operation to Use Gating during SSDT is On

Actually, if there is no DPDCH transmitted, SSDT may not be needed. But, in the region where SSDT is used, UE cannot help using SSDT whether DPDCH transmission exists or not. However, in the case shown in figure 1 (b), gating may be used for saving battery life. In order that gating operates propoerly, another method is needed. In this section, operation of gating is described during SSDT is activated. The proposed operation method is as follows:

- If the condition for initiating gating is satisfied when SSDT is activated or SSDT is activated during gating, both UE and Node B perform normal soft handover operation without explicit signaling. In detail, UE generates uplink TPC command after radio link combination and Node B acts as if it is the primary cell.
- After termination of gating, the normal SSDT operation is resumed. In other side, if SSDT is terminated during gating, there is no change in opration of gating. In these changes of operation, additional explicit signalling is not needed.

Summary of the operation is shown in table 1.

Situation		Operation
During SSDT is activated	Gating is intiated	Change to normal soft handover operation
	Gating is terminated	Change to normal SSDT operation
During gating is activatd	SSDT is initiated	Normal soft handover operation (no operation change)
	SSDT is terminated	Normal soft handover operation (no operation change)

Table 1. Operation of SSDT depending on gating

Conclusion

This contribution proposes a proper operation method of SSDT when gating is used and that of gating when SSDT. This method makes UTRAN and UE operate properly without any explicit higher layer signaling and UE can save its battery power.

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----------Text Proposal for TR 25.840----------

6.1.8.4 SSDT

~~Gated DPCCH shall be disabled when the soft handover is initiated with SSDT.~~

In order that gating is operated propoerly in SSDT region, it is needed to modify the operation of SSDT. Modification of SSDT operation can be summarized as follows:

- If the condition for initiating gating is satisfied when SSDT is activated or SSDT is to be activated during gating, both UE and Node B perform normal soft handover operation without explicit signaling. In detail, UE generates uplink TPC command after radio link combination and Node B acts as if it is the primary cell.
- If SSDT is still activated after gating is terminated, the normal SSDT operation is resumed without explicit signaling.