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Agenda item: Rel4 Issues/ AH22

Source: Samsung and Nokia

Title: Modification of SSDT to Support DPCCH Gating in SSDT Region

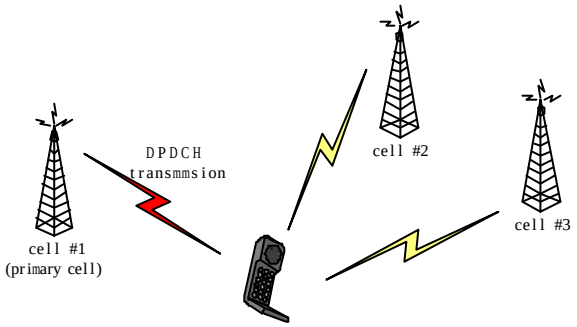
Document for: Discussion and approval

Introduction

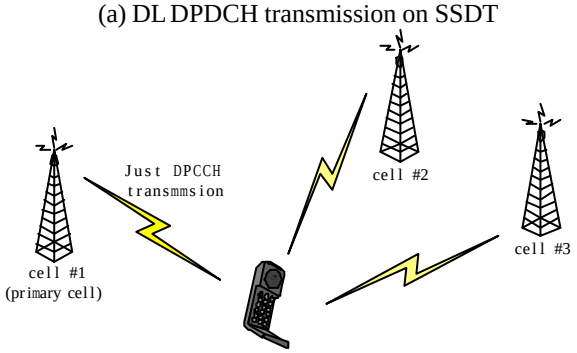
In the current TR 25.840 v2.1.0 [1], it is described that gating shall not be used when SSDT is activated. For further improvement of UE battery life through better utilization of gating, we have proposed the method for enabling the use of gating when there is no DPDCH transmission even if UE is in SSDT region [2] during the TSG RAN WG1 meeting #18. In this contribution, this proposal is more detailed.

Proposed Method to Use Gating in SSDT Region

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 that there is trasmission of DPDCH from primary cell when SSDT is used. In this case, gating cannot be initiated. But if there is no DPDCH transmission during SSDT is activated, as shown in figure 1-(b), there is the possibility that gating can be used through some modifications of SSDT operation, because SSDT may not be needed when there is no DPDCH transmision.



(a) DL DPDCH transmission on SSDT



(b) No DPDCH transmission on SSDT

Figure 1. Behavior of SSDT depending on existence of DPDCH

Thus, for further improvement of UE battery life through better utilization of gating, we propose the method to enable the use of gating when there is no DPDCH transmission even if UE is in SSDT region. The proposed 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 the cell in active set perform normal soft handover operation without explicit signaling. In detail, UE generates uplink TPC command after radio link combination and each cell in active set acts as if it is the primary cell.
- After termination of gating, the normal SSDT operation is resumed without additional explicit signalling. In other side, if SSDT is terminated during gating, there is no change in handover opration, i.e., normal soft handover operation will still work.

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. Proposed operation for the use of gating in SSDT region

Conclusion

This contribution proposes the modification of SSDT to support DPCCH gating even if UE is in the region that SSDT is activated. The proposed method does not require any additional explicit signalling. The advantage of this proposal is that UE battery life can be further improved through the better utilization of DPCCH gating.

References

[1] R1-01-0179, 3G TR 25.840 v2.1.0 “Terminal power saving features”.
[2] R1-01-0142, “Answers to Comments on TR 25.840 Terminal Power Saving Features”, Samsung and Nokia.

Contact Points

Ju Ho Lee juholee@samsung.com
Yongjun Kwak evatt@samsung.com
Markku Tarkiainen markku.tarkiainen@nokia.com

---------- Start of text proposal for TR 25.840 ----------

6.1.8.4 SSDT

~~Gating shall be disabled by higher layer signaling when the soft handover is initiated with SSDT. The termination of gating and the initiation of SSDT can be performed by a single higher layer signaling message. Thus, no additional signalling is required.~~

Gating can be initiated when there is no DPDCH transmission. And, if there is no DPDCH transmission, SSDT may not be needed. Considering this, UE battery life can be further improved by modifying the operation of SSDT so that gating can be used even if UE is in the region that SSDT is activated.

Modification of SSDT operation to support gating is 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 the cell in active set perform normal soft handover operation without explicit signaling. In detail, UE generates uplink TPC command after radio link combination and each cell 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.

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