

Motivation for new Study Item proposal: Study on Downlink Enhancements for UMTS

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Downlink Enhancements for UMTS

- **Justification**

- WCDMA currently serves as the dominant mobile broadband technique. The number of connections for WCDMA users and the average user data rate have continued to increase in the past years and will further increase in the coming years, which requires WCDMA to evolve further from both uplink and downlink perspective.
- A Rel-12 WI on Further EUL Enhancements has been standardized to enhance uplink performance. The WCDMA specifications should be further evolved to enhance the downlink performance in various aspects, including:
 - Reduction of DL control channel overhead, especially in case of a large number of DL connections which may result in a significant control channel overhead.
 - Enhanced DTX/DRX in multi-RAB case to further improve power consumption efficiency.
 - Improvements to signaling transmission, e.g. signaling optimization for RRC state transition, improvements to parameter update mechanism, etc.
 - Enhanced SRB over HSPA performance, especially from SRB coverage perspective.

- **Objectives**

- Investigate mechanisms to enhance DL control channel performance, for example:
 - Repeat DL TPC commands in a number of consecutive slots to allow soft combining at the UE in order to reduce DL TPC transmit power.
- Investigate mechanisms to enhance DTX/DRX when DCH and HSPA are simultaneously configured, especially for the case that SRB is transmitted over DCH only.
- Investigate mechanisms to enhance downlink signaling performance on overhead and latency, especially for the case of RRC state transition and parameter updating.
- Investigate mechanisms to enhance SRB coverage over HSPA.
- The study shall include considerations to minimize the impact on physical layer and legacy terminals and networks

Signaling transmission efficiency

- In order to further boost UMTS network capacity, signalling transmission efficiency would be further considered

DL DPCCH transmission overhead

- In case of PC algorithm 2, NW could guarantee the same TPC command so to reduce downlink power on TPC field.

RRC signalling optimization

- State transitions are seen quite frequent in current Network, signalling saving for state transition are seen useful
- Some parameter need fast reconfiguration to boost network KPI

SRB over HSPA performance improvement

- SRB over HSPA downlink coverage improvement
- SRB over DCH DPCH overhead reduction eg introduce DRX/DTX for DPCH TTIs w/o SRB transmission