Source: TSG-SA WG4
To: TSG-RAN WG2, TSG-T, TSG-GERAN, TSG-RAN WG1
Cc: TSG-CN WG4
Title: Reply on Default Configurations for Handover

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TSG-SA WG4 (S4) would like to thank TSG-RAN WG2 for their LS (R2-002463) on default configurations for handover from GSM to UMTS. The proposals provided by S4 for conversational speech are based on the principles:

1) **use DTX (=SCR) in uplink** to save battery power within the terminal.
   Note: DTX needs two additional TFCI code points: SID and No_Data.
2) **use DTX in downlink** to allow TrFO and TFO, when the distant side uses DTX in uplink.
   Note: the UE shall always be able to receive DTX in downlink.
3) **use the highest bit rate** for best quality, when only one Codec Mode is allowed (e.g. due to TFCI restrictions).
4) **use Codec Types and Codec Configurations that are preferred for TFO and TrFO**.
5) **do not change Codec Type and Codec Configuration during handover** (unless really necessary), because the connection could be in TFO and any change would influence the distant TFO partner.

Based on the received liaison statement S4 assumes that it is still possible to introduce these Pre-Configurations, including the necessary signalling, into UMTS_GSM dual_radio_access terminals of Release 99. S4 further assumes that the network can identify these terminals and distinguish them from UMTS_only terminals.

S4 would like to propose a slight modification of the UMTS_AMR Codec Type in these kind of dual_radio_access terminals (not in UMTS_only terminals):
UMTS_AMR2: "UMTS_AMR2 shall behave identical to UMTS_AMR, but the UE shall perform changes of the Codec Mode in uplink direction only every second speech frame. Changes of the Codec Mode in downlink direction shall be acceptable in every speech frame, as in UMTS_AMR."

This UMTS_AMR2 would have substantial advantages in terms of interoperability with GSM networks and is therefore preferred.
Background: In UMTS networks this UMTS_AMR2 and the UMTS_AMR Codec Type are fully identical in downlink and fully compatible uplink direction. The only (marginal, but essential) difference is in the intervall the UE can change the Codec Mode (the Rate) in uplink direction (every 20ms in UMTS_AMR, every 40ms in UMTS_AMR2). The UMTS_AMR2 is fully compatible with all UMTS and GSM networks, while the UMTS_AMR is not compatible with GSM networks. Tandem Free or Transcoder Free Operation with GSM (GERAN) networks is therefore only possible with FR_AMR or UMTS_AMR2.

S4 assumes that the UMTS_AMR2 will be the default Codec Type for these kind of terminals. If this is - unfortunately - not correct, then replace UMTS_AMR2 by UMTS_AMR in R99.
On this basis S4 proposes the following four Speech Pre-Configurations (most important first):

Speech _1: UMTS_AMR2 with one speech mode: 12.2 kBit/s plus AMR_DTX.
    This Configuration provides best speech quality with minimal TFCI and RFCI code space and efficient battery saving within the UE (due to DTX).

Speech_2: UMTS_AMR2, four speech modes: 10.2, 6.7, 5.9, 4.75 kBit/s plus AMR_DTX.
    This Configuration provides best speech quality with moderate TFCI and RFCI code space and efficient battery saving within the UE (due to DTX). It is TFO compatible with GSM terminals running the default FR_AMR. It should be used when it was used before the handover.

Speech_3: UMTS_AMR2, four speech modes: 7.4, 6.7, 5.9, 4.75 kBit/s plus AMR_DTX.
    This Configuration provides best speech quality with moderate TFCI and RFCI code space and

efficient battery saving within the UE (due to DTX). It is TFO compatible with GSM terminals running the default HR_AMR. It should be used when it was used before the handover.

Speech _4: UMTS_AMR2 with one speech mode: 7.95 kBit/s, plus AMR_DTX.
This Configuration provides good speech quality with minimal TFCI and RFCI code space and efficient battery saving within the UE (due to DTX).

Finally S4 would like to ask to consider whether it would be posssible to introduce a "flexible" pre -configuration for the UMTS_AMR2 Codec Type that uses exactly the same Codec Configuration after handover that was used before the handover. This would support any TFO constellation and a smart handover without any signalling overhead.