Sub-frame Level Sleep Motivation and Design Considerations

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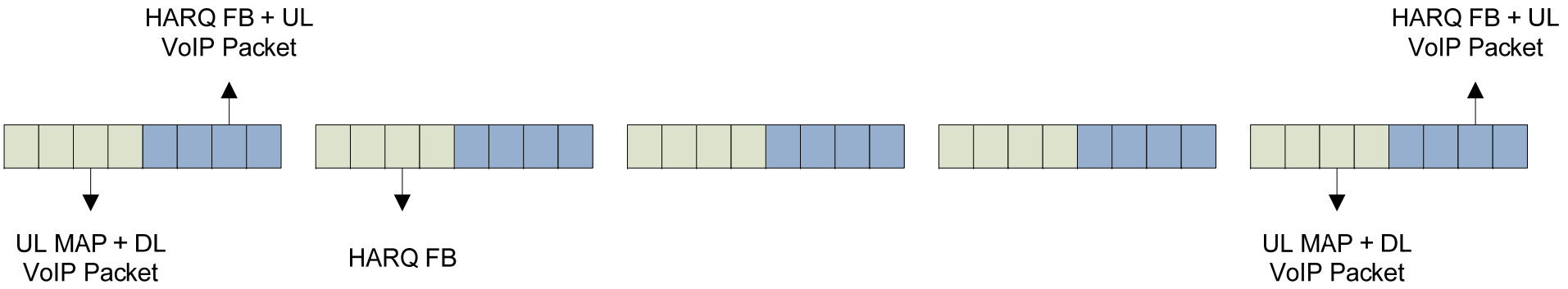
Purpose: to be discussed and adopted by TGm for the 802.16m SDD

Current Suggestion

– The current 16m draft supports **frame** granularity for Sleep.
– Original motivation is not clear
  - 16e supports frame granularity, as this is the basic scheduling timeslot. It is not clear why this was not followed in 16m.

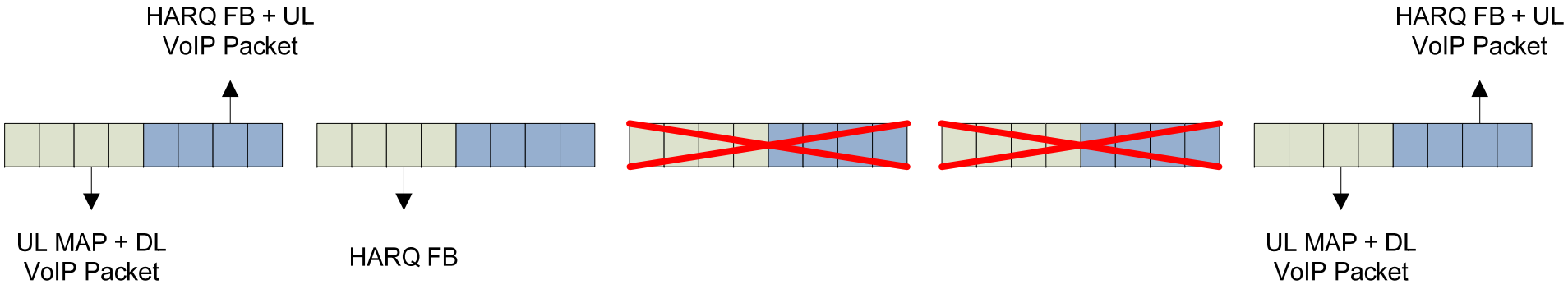
VoIP Scenario

– Assumptions
  - 20ms interarrival time
  - MS is requires to receive a single DL subframe to receive the VoIP packet and HARQ feedback and 1 UL subframe to transmit HARQ feedback and send HARQ information.
  - DL:UL = 4:4 (subframes).



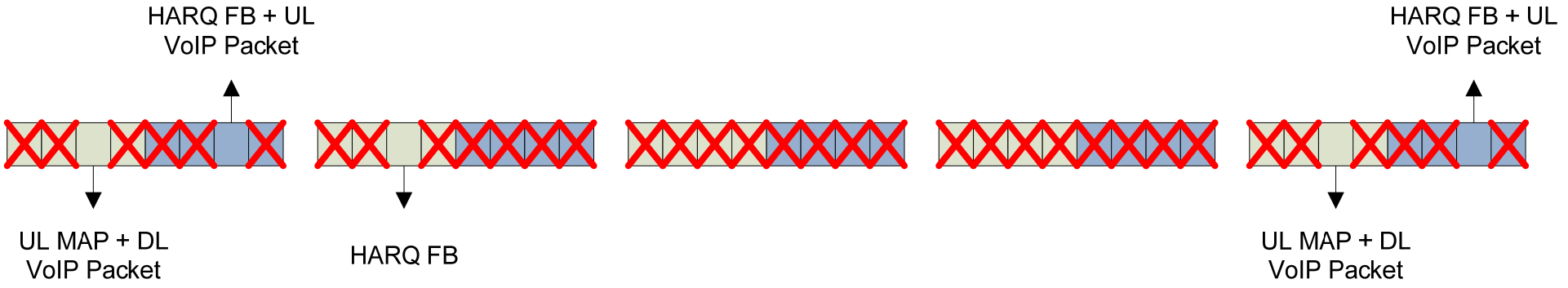
Possible 16m Timeline – Frame Sleep

– Best case scenario (no retransmissions) ➔ sleep 50% of the subframes



Possible 16m Timeline – Subframe Sleep

– Best case scenario ➔ Sleep 29/32 = ~**90%** of the subframes
  - Power consumption reduction of **~54%** (if we assume 5X active power over sleep power per subframe)



Conclusions

- Supporting Sleep with granularity of subframes is extremely important to further reduce MS's power consumption and thus increase its battery lifetime which is **a major requirement for a 16m MS.**
  - Also required to be competitive to LTE devices.
- HARQ timing and UL MAP relevance should also be considered to enable this tight sleep pattern.
- MS should not be forced to wake up on a superframe boundary to receive the SFH, since it can assume SFH will not be changed in most cases (MAP should include an indication of any change).