

Liaison To: TSG-SA WG4 Codec Working Group
From: TSG-RAN WG1
Title: Liaison statement on classification of AMR speech bits

TSG RAN WG1 is considering that the unequal error protection (UEP) scheme is desirable for L1 AMR speech transmission. There are three classes of AMR speech data bits [1]. If the speech data bits of different classes are separately transmitted on different transport channels, blind transport format detection (BTDF, see section 4.2.15.1 of [2]) should be performed, relying on the CRC attached to class A bits because it is supposed to have the highest transmission quality. Otherwise the BTDF performance will be degraded due to the relatively low transmission quality of class-B or -C bits.

From the current classification of AMR speech data bits [1], a duplicated number of bits within class-A i.e. 55 bits, is specified for both AMR6.7 and AMR5.9 modes and BTDF that relies only on the CRC attached to class-A bits can not basically distinguish these two modes. In order to achieve reliable BTDF, that is to make these two AMR modes distinguished easily, TSG RAN WG1 would like to ask TSG SA WG4 for a possible slight modification on the AMR speech bit format as follows.

“For AMR6.7 mode, the bit assignment among the two classes: class-A and -B could be slightly modified, for example, the three highest important bits* of class-B are to be reassigned to class-A”.

Class-A and class-B then will have 58 bits and 76 bits respectively. Since only around 2 % of the speech data bits are moved between the different classes, namely different transport channels within AMR6.7 mode by using the above way, it is supposed that such a slight modification will give almost no impact on L1 transmission efficiency. TSG RAN WG1 would also like TSG SA WG4 to advise us if there is any speech quality degradation of AMR speech codec itself because of such a slight modification.

*Note: Moving these three bits will make the number of class-A bits of AMR6.7 58 bits, that is in-between the number of the class-A bits of AMR7.4 (= 61 bits) and that of AMR5.9 (= 55 bits). One bit should be moved at least if the moving three bits would cause some problem for speech codec.

References:

- [1] TSG-SA Codec Working Group, “Mandatory Speech Codec speech processing functions; AMR Speech Codec Frame Structure”, TS 26.101 V1.3.0
- [2] TSG-RAN Working Group 1, “Multiplexing and channel coding (FDD)”, TS 25.212 V2.2.0