

Source: Ad hoc #4 chair

Title: Ad hoc #4 second report

1 Introduction

This is the report of the RAN WG1 ad hoc #4, "Multiplexing", meeting on the evening of Thursday, September 2, and the morning of Friday, September 3, 1999.

2 Contributions discussed

(99)b85 Effect of EEP and UEP on channel coding for AMR (Nokia)

The contribution presents simulation results comparing UEP and EEP channel coding for AMR. The conclusion from the paper is that there are Eb/No gains by using UEP. Hence, the contribution proposes that UEP should be supported for AMR speech in Release 99. This was supported by other parties, that indicated that the minimum number of supported simultaneous TrCHs for a speech capable terminal should include support for UEP. That would mean as a minimum 3 TrCHs for the speech data, 1 for DCCCH and possibly 1 for other AMR-related signalling (depending on how fast such signalling would need to be).

The paper also tries to identify the way forward on determining how speech should be supported. Nokia favour a toolbox approach since they think it will be hard to specify all parameters (for example rate matching) before the end of the year.

It was commented that the selection of UEP or EEP is not a decision for WG1, and that it would not be documented in the WG1 specifications. It was also suggested that WG1 would share or simulation results and investigation results with other groups.

(99)b86 Transmitting AMR and signaling on SF=256 in downlink (Nokia)

Contains a number of different approaches for fitting AMR onto SF 256. Recommends that blind transport format detection should be supported in the UE for flexible positions of the TrCHs when the number of TFCs is limited. Also propose dim & burst method when AMR is mapped to SF 256. Proposes that new slot formats are introduced.

It was agreed that the text proposal is a special case of the text agreed yesterday (99)d38.

It was pointed out that the order of the different TrCHs in the radio frame is a higher layer issue. Similarly, dim & burst is not a WG1 decision. It was further commented that there may be large delays using dim & burst, since the codec is in the core network, and hence signalling between UTRAN and core network would be needed.

(99)c46 Comparison between UEP and EEP for AMR channel coding (Nortel)

The contribution presents simulation results comparing UEP and EEP channel coding for AMR. The conclusion from the paper is that there are Eb/No gains by using UEP. Hence, the contribution proposes that UEP should be supported for AMR speech in Release 99.

It was clarified that the rate matching is different for the two modes simulated (AMR12.2 and AMR7.95). Consequently, the simulations assume more than 3 TrCHs but at most 3 at the time.

(99)d33 L1 transmission method fit for AMR speech (NTT DoCoMo, Ericsson)

Proposes that at least 3 TrCHs should be supported for the dedicated speech TrCHs. It is further proposed that 12 bit CRC is added. Also, stealing of class C bits to use for DCCH was indicated as being possible. It was commented that stealing would not be feasible within L1 only.

Propose that the number of bits is changed so that the number of bits of class A are different for all modes.

It was stated by other parties that the number of TrCHs could be used as a minimum number for baseline capability. However, coding rate parameters and CRC length is not a minimum capability.

(99)c54 Blind rate detection for AMR speech transmission (NTT DoCoMo)

DoCoMo's investigations indicates that 8 bit CRC is too short for acceptable performance of blind transport format detection. 16 bits on the other hand results in too much overhead. It is proposed to add a 12 bit CRC and that the number of bits in class A is modified so that it is different for all classes.

This was agreed, so the text proposal regarding the 12-bit CRC should be approved and a LS should be sent to TSG-S4 indicating that WG1 prefer if the different modes of class A all have different number of bits.

(99)c30 Towards the support of UEP for speech in UTRA (Nortel)

The contribution is an introductory document to the liaison statement proposal in (99)a59.

(99)a59 Draft liaison statement on support of speech service in RAN (Nortel)

This liaison describes the tools available in the physical layer to support transfer of speech. Some comments were raised, and it was agreed that the liaison should be updated according to the comments to clarify the description.

It was agreed that a liaison of this type should be sent, and an updated version will be presented to the plenary. The proposed receivers of the liaison would be TSG-S4, TSG-R2 and TSG-R3.

Not related to any particular contribution, a discussion took place about blind transport format detection when flexible positions are used. It was clarified that with flexible positions the DL rate matching will be different for the different transport formats, which would result in the need to do several decoding rounds in the Viterbi decoder instead of the up to now assumed single round. That this would lead to higher blind detection complexity was acknowledged, however it was also stated that if the number of transport formats was low enough the complexity could still be manageable.

3 Conclusion

A discussion took place on what the WG1 conclusions should be. It was concluded that:

- WG1 recognises the potential performance benefits with UEP to support AMR, hence the tools to provide UEP should be included in Release 99.
- As a minimum, three simultaneous transport channels to carry speech data, should be supported as a baseline capability for all terminals supporting AMR. In addition to those three, there will be a transport channel for DCCH and potentially one more for the speech related signalling. If these three transport channels are from a set of several transport channel, or if there are only three transport channels defined is FFS.
- WG1 recommends the use of TFCI for uplink, since blind transport format detection is complex in uplink. For the downlink, both blind transport format detection and TFCI transmission should be possible. Exactly under what conditions blind transport format detection should be supported by the terminal is FFS.
- Convolutional coding should be mandatory to support for a speech capable terminal.
- 12-bit CRC seems reasonable to use in relation with blind transport format detection.
- TSG-S4, TSG-R2 and TSG-R3 should be informed about WG1's view on the above points.

Ad hoc #4 recommends the WG1 plenary to accept the text proposal in (99)c54 that was endorsed by the ad hoc.