

**TSG-RAN Working Group 2 (Radio layer 2 and Radio layer 3)
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To: TSG RAN WG2
Source: TSG RAN WG1
Title: Liaison statement on layer 1 segmentation

TSG RAN WG1 thank TSG RAN WG2 for their liaison statement [1] and would like to give the following comments to item 3.

WG1's opinion is that it is beneficial to have the possibility to perform concatenation and segmentation of transport blocks before coding on layer 1. As CRC is added on transport block level, higher layer segmentation must make sure that the transport block lengths are suitable for error detection. If layer 1 is allowed to perform concatenation and segmentation, layer 1 can make sure that the gain from coding is maximized for all transport channels regardless of higher layer requirements on transport block sizes.

Current assumption in WG1 is that concatenation of transport blocks before coding is allowed for obtaining better performance for turbo encoded transport channels. In order to put reasonable upper limits on HW complexity, segmentation is performed after the concatenation (before coding).

The only problem that WG1 has identified with concatenation and segmentation on layer 1 is that it would affect the use of Hybrid type II/III ARQ since the coding no longer is done on the unit that error detection is offered on. If Hybrid type II/III ARQ is included in release 00, WG1 propose that it should be possible to turn off the layer 1 concatenation/segmentation. However, no such need has been identified for release 99.

For convolutional coding, segmentation is performed if the number of bits (including CRC) exceeds 504 bits. From a HW perspective this is viewed as a rather high number. Consequently, WG1 would like to keep this limit as it is. However, if segmentation is allowed on layer 1, transport blocks can be larger than this. If WG2 allows transport block lengths that are larger than the WG1 segmentation limit, more overhead (tail bits) will be added compared to if no segmentation is performed. It should be noted that the segmentation limit in WG1's opinion is set so that the extra overhead is negligible. Hence, the segmentation does not compromise performance. Switching between convolutional and turbo coding in-between TTIs have not been investigated by WG1.

[1] TSG RAN WG2, "TSGR2#6(99)982, TSGR1#7(99)c41 LS answering WG1's comments on 25.302".