RAN WG1 meeting #4 **TSGR1#4(99)350**

Place	**:**	**Yokohama (Japan)**
Date	**:**	**19nd 20th April 1999**
Title	**:**	**Periodic alignment of transmission times of transport channels**
Source	**:**	**Mitsubishi Electric**
Paper for	**:**	**Decision**

1 Introduction

This document proposes clarification about the timing of the different transport channels. The first clarification (section First clarification) is rather obvious, whereas the second one (section Second clarification) needs more discussion.

2 References

[1] S1.12 v1.1.0 FDD Multiplexing and channel coding

3 Proposition of clarification

For any transport channel $\boldsymbol{c}$ a transport block set is delivered periodically by MAC to L1 with a period $\boldsymbol{TTI_c} \in \{1,2,4,8\}$ expressed in radio frames. In other words the frame number $\boldsymbol{n}$ of the radio frame for which a transport block set is delivered by MAC to L1 for TrCH $\boldsymbol{c}$ are :

$$\boldsymbol{n} = \boldsymbol{n_c} + k \cdot \boldsymbol{TTI_c} \text{ modulo } 72 \text{ for } k \text{ integer}$$

3.1 First clarification

A first point that seems obvious but that is not clearly said in [1] is that for all the transport channels $c_1, c_2, \ldots, c_u$ that have the same QoS q we have :

$$n_{c_1} = n_{c_2} = \cdots = n_{c_u} = n_q$$

$$TTI_{c_1} = TTI_{c_2} = \cdots = TTI_{c_u} = TTI_q$$

Then we propose that this be clearly said somewhere in [1]

3.2 Second clarification

Whichever be two transport channels $\boldsymbol{c}$ and $\boldsymbol{d}$, $\boldsymbol{TTI_c}$ and $\boldsymbol{TTI_d}$ are always multiple one of the other one. Then it is possible to force that for all the transport channels $\boldsymbol{c}$, $\boldsymbol{n_c}$ had the same value. This would ensure that at least every 8 radio frames we are at the beginning of the transmission interval for all the existing transport channels.

This would have the advantage that at that time the TCFI mapping rule can be changed smoothly, and especially the maximum TFI respective to all the transport channels.
Otherwise there is the risk that we are always in the middle of the TTI of some transport channel, and changing at that time the value of the maximum TFI for that transport channel would be complex, because the way how the TFCI is interpreted might well depend of the maximum TFI of each transport channel.

Then we propose to have this periodic alignment of all the transport channels. An LS needs to be sent to WG2 about this before taking decision.

4 Text proposal

We propose to modify section 4.2 of [1] as follows :

4.2 Transport-channel coding/multiplexing

<Editor's note: The following is taken from ETSI specs..>

Data arrives to the coding/multiplexing unit in form of transport block sets, once every transmission time interval, which constitutes a transmission event. The transmission time interval is transport-channel specific from the set {10 ms, 20 ms, 40 ms, 80 ms}. For any transport channel ***c*** the radio frame numbers on which occur the transmission events can be expressed as :

$$n = n_0 + k \times TTI_c \text{ modulo } 72,$$

where

- TTI_c is the transmission time interval of ***c*** expressed in radio frames ({1, 2, 4, 8 }),
- ***k*** is an integer, and
- n_0 is a constant in {0, 1, …, 7} not depending on ***c***.

Transport channels with the same Quality of Service (QoS) have the same transmission time interval.

<Editor's note: The following is taken from ARIB specs. Results of Ad Hoc4 is reflected.>

Two or more services having different Quality of Service (QoS) requirements are multiplexed into one or more physical channels using a physical channel segmentation unit. Rate matching is used to adjust the channel symbol rates (i.e., symbol rate after physical channel segmentation) to an optimum level, where minimum QoS requirement of each service is fulfilled with the same channel symbol energy. The rate matching uses the algorithm described in section 4.2.4.

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5 Conclusion

In this paper we have proposed some clarification about the alignment of transmission events from transport channels.
We propose to send an LS to WG2 to get their opinion on the subject before any action.