3GPP TSG-RAN WG2 meeting #6 ***Document*** ***R2(99)892***

Sophia Antipolis, France, 16-20 Aug 1999

3G CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

25.302 **CR** **001** Current Version: 3.0.0

3G specification number ↑ *↑ CR number as allocated by 3G support team*

For submision to TSG RAN #5 *list TSG meeting no. here ↑*

for approval [X]
for information [ ]

(only one box should be marked with an X)

Form: 3G CR cover sheet, version 1.0 *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/3GCRF-xx.rtf*

Proposed change affects: *(at least one should be marked with an X)* USIM [ ] ME [X] UTRAN [X] Core Network [ ]

Source: Ericsson **Date:** 1999-08-17

Subject: Making all transport block equally sized within a transport block set

3G Work item:

Category: *(only one category shall be marked with an X)*

F	Correction	
A	Corresponds to a correction in a 2G specification	
B	Addition of feature	
C	Functional modification of feature	X
D	Editorial modification	

Reason for change: It is proposed that all transport blocks within a given transport block set shall be of the same size. The restriction has been proposed to RAN WG2 by RAN WG1 in order to avoid changes in the multiplexing within the physical layer, as defined by WG1.

Clauses affected: 7.1.3, 7.1.5, 7.1.7

Other specs affected:

Other 3G core specifications	[ ]	→ List of CRs:
Other 2G core specifications	[ ]	→ List of CRs:
MS test specifications	[ ]	→ List of CRs:
BSS test specifications	[ ]	→ List of CRs:
O&M specifications	[ ]	→ List of CRs:

Other comments:

help.doc

<--------- double-click here for help and instructions on how to create a CR

7 Formats and configurations for L1 data transfer

7.1 General concepts about Transport Channels

Layer 2 is responsible for the mapping of data onto L1 via the L1/L2 interface that is formed by the transport channels. In order to describe how the mapping is performed and how it is controlled, some definitions and terms are required. The required definitions are given in the following sections. Note that the definitions are generic for all transport channel types, i.e. not only for DCHs.
All Transport Channels are defined as unidirectional (i.e. uplink, downlink, or relay-link). This means that a UE can have simultaneously (depending on the services and the state of the UE) one or several transport channels in the downlink, and one or more Transport Channel in the uplink.

7.1.1 Transport Block

This is the basic unit exchanged between L1 and MAC, for L1 processing.
A Transport Block typically corresponds to an RLC PDU or corresponding unit. In the TDD mode it may possibly also be formed by a MAC peer-to-peer message. Layer 1 adds a CRC for each Transport Block.

7.1.2 Transport Block Set

This is defined as a set of Transport Blocks which are exchanged between L1 and MAC at the same time instance using the same transport channel.

7.1.3 Transport Block Size

This is defined as the number of bits in a Transport Block. The Transport Block Size is always fixed within a given Transport Block Set, i.e. all Transport Blocks within a Transport Block Set are equally sized.

7.1.4 Transport Block Set Size

This is defined as the number of bits in a Transport Block Set.

7.1.5 Transmission Time Interval

This is defined as the inter-arrival time of Transport Block Sets, and is equal to the periodicity at which a Transport Block Set is transferred by the physical layer on the radio interface. It is always a multiple of the minimum interleaving period (e.g. 10ms, the length of one Radio Frame). The MAC delivers one Transport Block Set to the physical layer every TTI.
Figure 1 shows an example where Transport Block Sets, at certain time instances, are exchanged between MAC and L1 via three parallel transport channels. Each Transport Block Set consists of a number of Transport Blocks. The Transmission Time Interval, i.e. the time between consecutive deliveries of data between MAC and L1, is also illustrated. ~~Last, the case when the last Transport Block is smaller than the allowed size is shown, with the topmost Transport Block being partially empty.~~

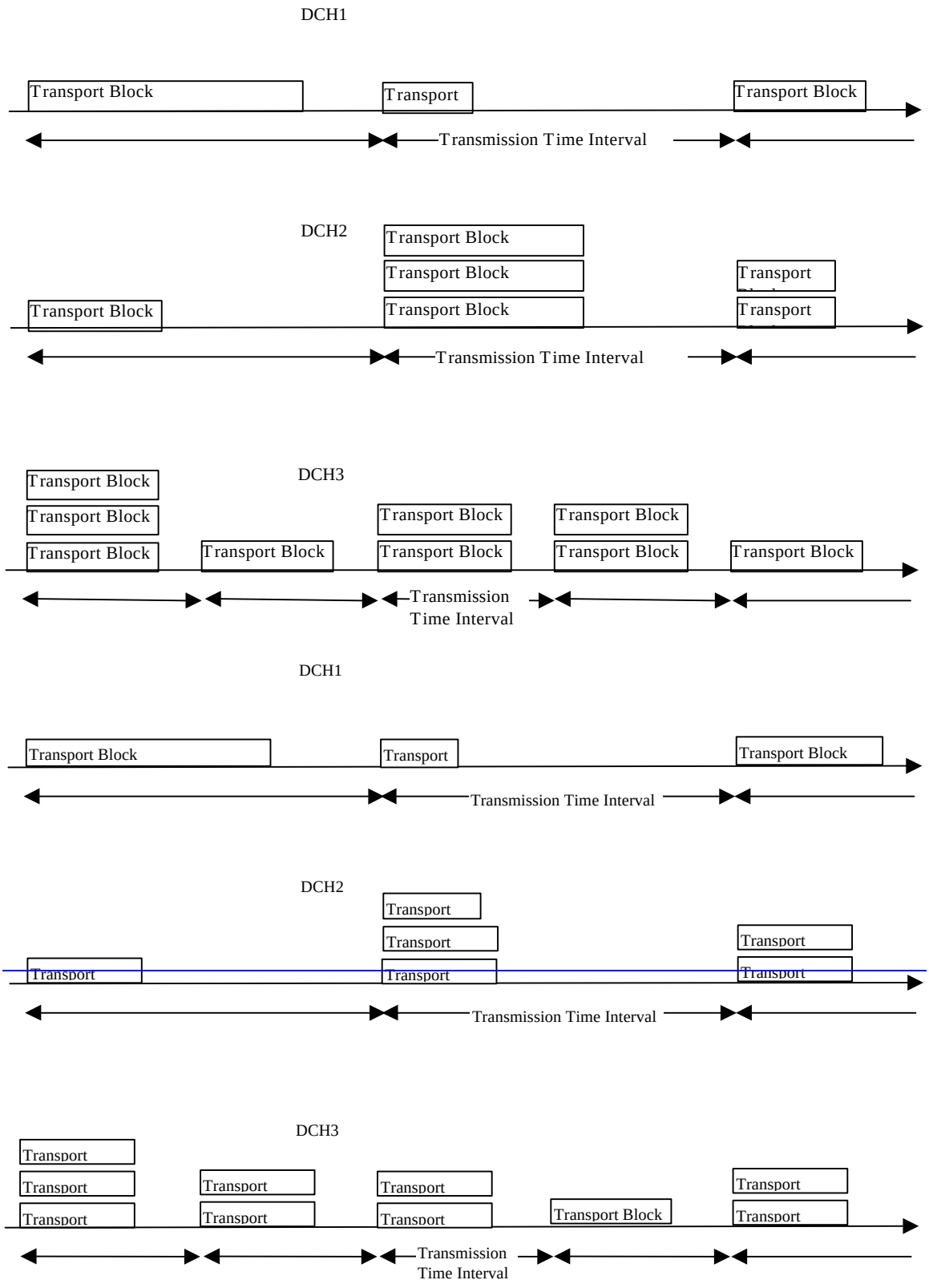

Figure 1. Exchange of data between MAC and L1

7.1.6 Transport Format

This is defined as a format offered by L1 to MAC (and vice versa) for the delivery of a Transport Block Set during a Transmission Time Interval on a Transport Channel. The Transport Format constitutes of two parts – one *dynamic* part and one *semi-static* part.
Attributes of the dynamic part are:

- Transport Block Size
- Transport Block Set Size
- Transmission Time Interval (optional dynamic attribute for TDD only)

Attributes of the semi-static part are:

- Transmission Time Interval (mandatory for FDD, optional for the dynamic part of TDD NRT bearers)
- Error protection scheme to apply
  - Type of error protection e.g. Turbo Code, Convolutionnal Code
  - convolutional code ratio
  - Resulting code ratio after static rate matching
- Size of CRC

In the following example, the Transmission time Interval is seen as a semi-static part
Example:

- Dynamic part: {320 bits, 640 bits}, Semi-static part: {10ms, Inner coding only, repeat 1/12 of the bits}

7.1.7 Transport Format Set

This is defined as the set of Transport Formats associated to a Transport Channel.
The semi-static parts of all Transport Formats are the same within a Transport Format Set.
Effectively the first two attributes of the dynamic part form the instantaneous bit rate on the Transport Channel.
Variable bit rate on a Transport Channel may, depending on the type of service which is mapped onto the transport channel, be achieved by changing between each Transmission Time Interval one of the following:
~~1.the Transport Block Size only~~
~~2.~~1. the Transport Block Set Size only
~~3.~~2. both the Transport Block Size and the Transport Block Set Size
Example 1:

- Dynamic part: {20 bits, 20 bits}; {40 bits, 40 bits}; {80 bits, 80 bits}; {160 bits, 160 bits}
- Semi-static part: {10ms, Inner coding only, repeat 1/12 of the bits}

Example 2:

- Dynamic part: {320 bits, 320 bits}; {320 bits, 640 bits}; {320 bits, 1280 bits}
- Semi-static part: {10ms, Inner coding only, repeat 1/12 of the bits}

The first example may correspond to a Transport Channel carrying a speech service, requiring blocks delivered on a constant time basis. In the second example, which illustrates the situation where a non-real time service is carried by the Transport Channel, the number of blocks delivered per Transmission Time Interval varies between the different Transport Formats within the Transport Format Set. Referring to Figure 1, the Transport Block Size is varied on DCH1and DCH2. ~~whereas the Transport Block Set Size is fix~~. That is, a Transport Format Set where the dynamic part has a variable Transport Block Size has been assigned for DCH1. On ~~DCH2 and~~ DCH3 it is instead only the Transport Block Set Size~~s~~ that is~~are~~ varied. That is, the dynamic parts of the corresponding Transport Format Sets only include variable Transport Block Set Sizes.