3GPP TSG-RAN meeting #4
Miami, USA, 17-18 June 1999

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3G CHANGE REQUEST

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

TS 25.301 **CR** **002** Current Version: 3.0.1

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

For submission to TSG RAN#4 *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: TSG-RAN WG2 **Date:** 08/06/99

Subject: Proposed modification of MAC functions

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: The MAC function "**Constrained execution of open loop power control algorithms**" currently marked as ffs, is proposed to be removed. It has been identified as not required, since power control related parameters are exchanged directly between RRC and L1. The explanatory text for the MAC function "**Successive Transmission on RACH**" is proposed to be reworded**,** since present explanation is not any more adequate, after change of the MAC random access procedure (the need for this function is still ffs).

Clauses affected:

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.

5.3.1.2 MAC functions

The functions of MAC include:

- **Mapping between logical channels and transport channels.** The MAC is responsible for mapping of logical channel(s) onto the appropriate transport channel(s).
- **Selection of appropriate Transport Format for each Transport Channel depending on instantaneous source rate**. Given the Transport Format Combination Set assigned by RRC, MAC selects the appropriate transport format within an assigned transport format set for each active transport channel depending on source rate**.** The control of transport formats ensures efficient use of transport channels.
- **Priority handling between data flows of one UE**. When selecting between the Transport Format Combinations in the given Transport Format Combination Set, priorities of the data flows to be mapped onto the corresponding Transport Channels can be taken into account. Priorities are e.g. given by attributes of radio access bearer services and RLC buffer status. The priority handling is achieved by selecting a Transport Format Combination for which high priority data is mapped onto L1 with a "high bit rate" Transport Format, at the same time letting lower priority data be mapped with a "low bit rate" (could be zero bit rate) Transport Format. Transport format selection may also take into account transmit power indication from Layer 1.
- **Priority handling between UEs by means of dynamic scheduling**. In order to utilize the spectrum resources efficiently for bursty transfer, a dynamic scheduling function may be applied. Priority handling on common and shared transport channels is realized by MAC. Note that for dedicated transport channels, the equivalent of the dynamic scheduling function is implicitly included as part of the reconfiguration function of the RRC sublayer. For TDD it is regarded as further study item.

  Note that in the TDD mode the data to be transported are represented in terms of sets of resource units.
- **Scheduling of broadcast, paging and notification messages**. This function provides mechanisms for efficient transfer of broadcast, paging and notification messages by means of appropriate scheduling and repetition of the messages.
- **Identification of UEs on common transport channels**. When a particular UE is addressed on a common downlink channel, or when a UE is using the RACH, there is a need for inband identification of the UE. Since the MAC layer handles the access to, and multiplexing onto, the transport channels, the identification functionality is naturally also placed in MAC.
- **Multiplexing/demultiplexing of higher layer PDUs into/from transport blocks delivered to/from the physical layer on common transport channels**. MAC should support service multiplexing for common transport channels, since the physical layer does not support multiplexing of these channels.
- **Multiplexing/demultiplexing of higher layer PDUs into/from transport block sets delivered to/from the physical layer on dedicated transport channels**. The MAC allows service multiplexing for dedicated transport channels. This function can be utilized when several upper layer services (e.g. RLC instances) can be mapped efficiently on the same transport channel. In this case the identification of multiplexing is contained in the MAC protocol control information.
- **Traffic volume monitoring**. Measurement of traffic volume on logical channels and reporting to RRC. Based on the reported traffic volume information, RRC performs transport channel switching decisions.
- **Routing of higher layer signalling**. This function performs the mapping of higher layer signalling messages to the appropriate transport channel. This function is required in TDD mode, where resource allocation is performed by the MAC autonomously.
- **Maintenance of a MAC signalling connection between peer MAC entities**. This function supports unacknowledged transfer of MAC-internal messages between peer MAC entities. A MAC signalling connection is required in the TDD mode.
- **Monitoring the links of the assigned resources**. This function provides means for monitoring link quality in TDD mode (used by MAC for fast DCA).
- **Dynamic Transport Channel type switching.** Execution of the switching between common and dedicated transport channels based on a switching decision derived by RRC**.**

The following potential functions are regarded as further study items:

- ~~**Constrained execution of open loop power control algorithms**. This function establishes layer 1 power levels within the constraints of open loop power control set by RRC.~~

  ~~*[Note: Details of this function need to be clarified.]*~~

- **Processing of messages received at common control channels**. This function is applied in TDD mode to support a data transfer on common control channels to support MAC operation (needed for fast DCA details are ffs.).

- **Successive Transmission on RACH.** This function is needed w~~W~~hen the mobile station continues to transmit the succeeding (second or more) radio frames because the message length is longer than a radio frame.~~, the transmission timing offset, the RACH spreading code and signature shall be determined as follows: The transmission timing offset (frame and/or slot) shall be determined pseudo-randomly. The RACH spreading code and the signature of the succeeding radio frame can be determined pseudo-randomly. The same RNTI shall be used as in the previous radio frame (for the radio frames belonging to the same higher layer PDU).~~

  [Note: This function requires further clarification. Contributions are invited.]

- **Ciphering**. This function prevents unauthorised acquisition of data.

  [Note: Ciphering is considered as further study item. This includes consideration where it is applied, for instance on MAC, RLC, or elsewhere, cf. Sec. 8.]

- **Access Service Class selection for RACH transmission**. The RACH resources (i.e. access slots and preamble signatures) may be divided between different Access Service Classes in order to provide different priorities of RACH usage. This function selects, based upon the type of data to be transmitted, the RACH parameters in accordance with the Service Access Class assignment.

  [Note: This function may support admission control. Its impact on BCCH capacity and its effects on RACH interference, retransmission and back-off time remains ffs.]