3GPP TSG-RAN meeting #6 **Document R2-99856**

Sophia Antipolis, France, 16-20 August 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.

TS 25.321 CR ?? Current Version: 3.0.0

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

For submision to TSG *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: Siemens AG **Date:** 13/08/99

Subject: MAC Signalling in TDD for USCH/DSCH operation

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	[X]
C	Functional modification of feature	[ ]
D	Editorial modification	[ ]

Reason for change: Introduction of needed elements in MAC to support USCH / DSCH operation in TDD.

Clauses affected: 4.2, 9.1, 9.2

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:

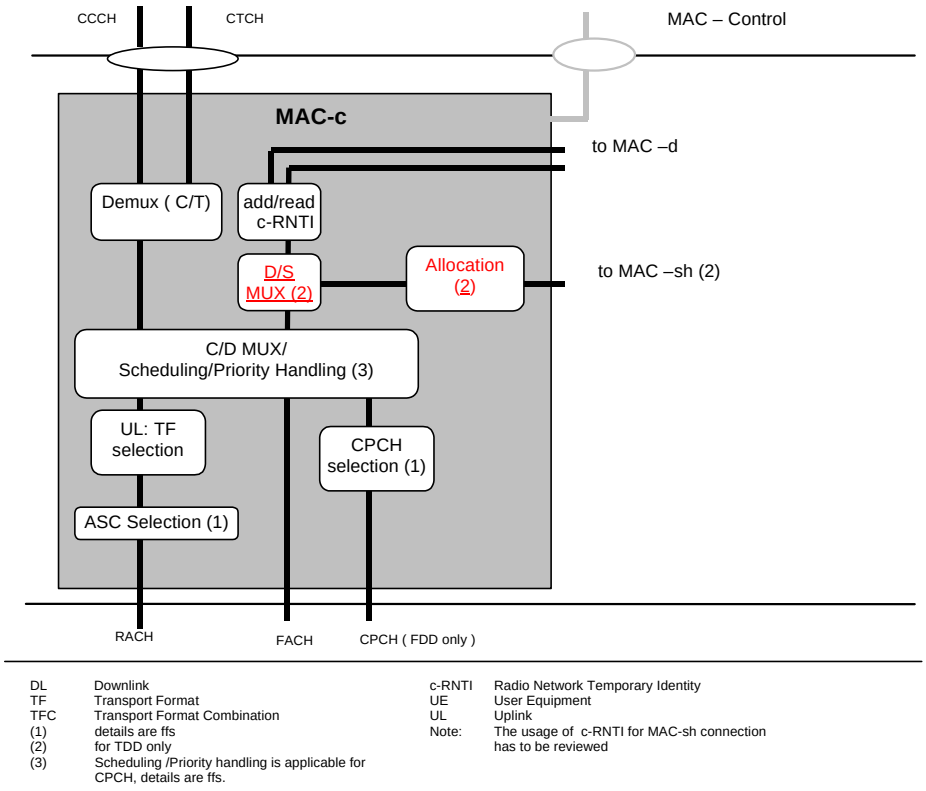
Other comments:

help.doc

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

Figure 4.2.3.2 shows the UE side MAC-c entity. The following functionality is covered:

- The C/D MUX box represents the insertion and detection of the field in the MAC header, indicating whether a common or dedicated logical channel is used.
- The D/S MUX box represents the insertion and detection of the field in the MAC header, indicating whether MAC communication to MAC-sh or to a dedicated logical channel is used. (TDD only)
- The c-RNTI field in the MAC header is used to distinguish between UEs.
- In the uplink, the possibility of transport format selection exists.
- Selection of Access Service Classes (ASC) for RACH, details on definition of ASC and the relation to the RACH retransmission algorithm are ffs.
- Multiplexing/scheduling /priority handling is used to transmit the received information on RACH and CPCH.
- Channel selection is used to select an appropriately sized and available CPCH for transmission.
- Demultiplexing of received information inside MAC-c to CTCH is used to support Short Message Service Cell Broadcast (SMS CB).
- The allocation box contains functionality required for USCH/DSCH operation (TDD only).



DL	Downlink	c-RNTI	Radio Network Temporary Identity
TF	Transport Format	UE	User Equipment
TFC	Transport Format Combination	UL	Uplink
(1)	details are ffs	Note:	The usage of c-RNTI for MAC-sh connection has to be reviewed
(2)	for TDD only		
(3)	Scheduling /Priority handling is applicable for CPCH, details are ffs.		

Figure 4.2.3.2. UE side MAC architecture / MAC-c details

Figure 4.2.4.2 shows the UTRAN side MAC-c entity. The following functionality is covered:

- The Scheduling – Priority Handling box manages FACH resources between the UE's and between data flows according to their priority. DL flow control is also provided to MAC-d.
- The C/D box represents the insertion and detection of the field in the MAC header, indicating whether a common or dedicated logical channel is used.
- The D/S MUX box represents the insertion and detection of the field in the MAC header, indicating whether MAC communication to MAC-sh or to a dedicated logical channel is used. (TDD only)
- For dedicated type logical channels, the c-RNTI field in the MAC header is used to distinguish between UEs.
- In the downlink, transport format selection might be done if FACH is variable rate.
- The multiplexing of CTCH information and the CB-Scheduling function inside MAC-c supports the Short Message Service Cell Broadcast (SMS CB).
- The allocation box contains functionality required for USCH/DSCH operation. (TDD only)

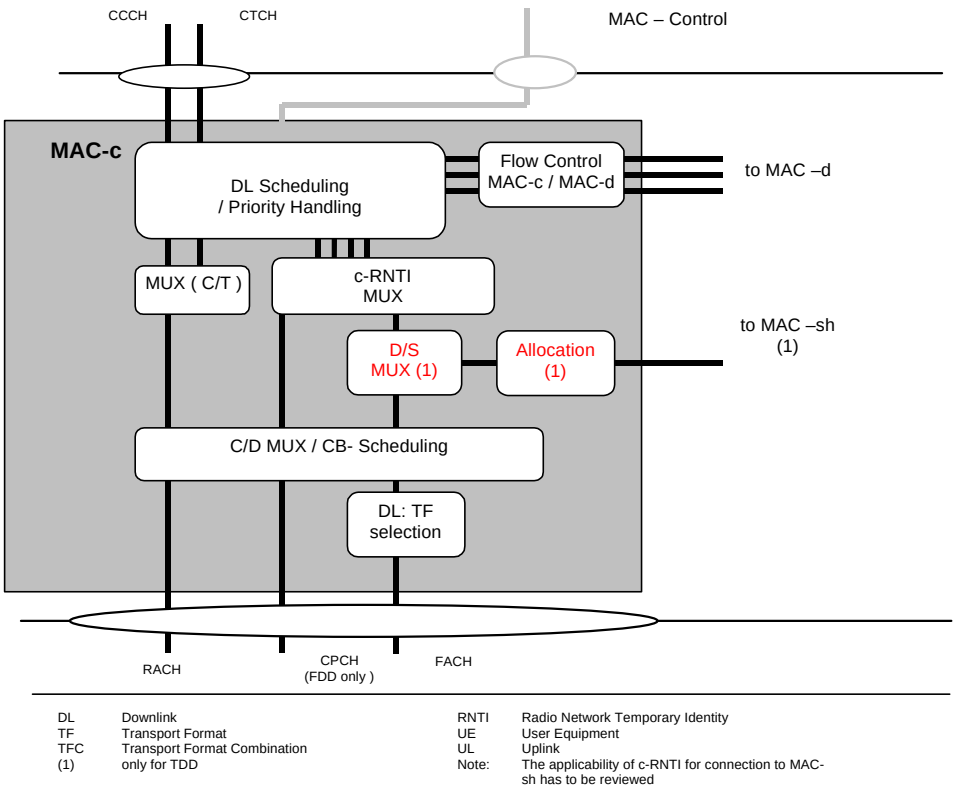


Figure 4.2.4.2 UTRAN side MAC architecture / MAC-c details

9 Elements for peer-to-peer communication

9.1 Protocol data units

9.1.1. MAC Data PDU

MAC PDU consists of an optional MAC header and a MAC Service Data Unit (MAC SDU), see figure 9.1.1. Both the MAC header and the MAC SDU are of variable size.

The content and the size of the MAC header depends on the type of the logical channel, and in some cases none of the parameters in the MAC header are needed.

The size of the MAC-SDU depends on the size of the RLC-PDU, which is defined during the setup procedure.

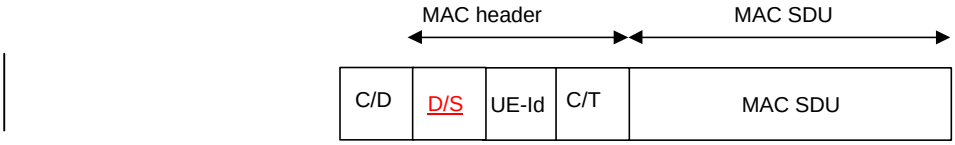


Figure 9.1.1.1 MAC data PDU

9.1.2. MAC Control PDU

MAC Control PDU consist elements for the control of the operation. The details are ffs.

9.2 Formats and parameters

9.2.1. MAC Data PDU: Parameters of the MAC header

The following fields are defined for the MAC header:

- C/D field
  The C/D field is a single-bit flag that provides identification of the logical channel class on FACH and RACH transport channels, i.e. whether it carries CCCH or dedicated logical channel information.

C/D field	Designation
1	CCCH
0	DCCH or DTCH

Table 9.2.1.1: Coding of the C/D Field

- C/T field
  The C/T field provides identification of the logical channel instance when multiple logical channels are carried on the same transport channel. The C/T field is used also to provide identification of the logical channel type on dedicated transport channels and on FACH and RACH when used for user data transmission. The size of the C/T field may be variable.

C/T field (e.g. 4 bits)	Designation
0000	Logical channel 1
0001	Logical channel 2
...	...
1111	Logical channel 16

Table 9.2.1.2: Structure of the C/T field

- D/S field (TDD only)
  The D/S field is a single-bit flag that indicates whether communication to MAC-sh is applied or a dedicated logical channel is used.

D/S field	Designation
1	MAC-sh
0	Dedicated logical channel

Table 9.2.1.3: Coding of the D/S Field

- UE-Id
  The UE-Id field provides an identifier of the UE . The following types of UE-Id are currently defined:

s-RNTI , this UE Id is related to the serving RNC
c-RNTI, this UE Id is related to the controlling RNC.

In addition for UE's having a RRC connection the S-RNC identifier exist.

s-RNTI together with S-RNC identifier is used for URA update RRC connection reestablishment and UTRAN originated paging messages and there associated responses.

c-RNTI is used as a UE identifier in all other DCCH/DTCH common channel messages on the air interface.

Note: Whether or not other UE-Id types are needed is ffs.

9.2.1.1. MAC header for DTCH and DCCH

a) DTCH or DCCH mapped to DCH, no multiplexing of dedicated channels on MAC:
No MAC header is required.

b) DTCH or DCCH mapped to DCH, with multiplexing of dedicated channels on MAC:
C/T field is included in MAC header.

c) DTCH or DCCH mapped to RACH/FACH:
D/S field (TDD only), C/D field and UE-Id are included in the MAC header. C/T field is included if multiplexing on MAC is applied.

d) DTCH or DCCH mapped to RACH/FACH, where DTCH or DCCH are the only channels (ffs).
D/S field (TDD only) and UE-Id field are included in MAC header. C/T field is included if multiplexing on MAC is applied.

e) DTCH or DCCH mapped to DSCH:
The MAC-PDU format for DSCH is left for further study.

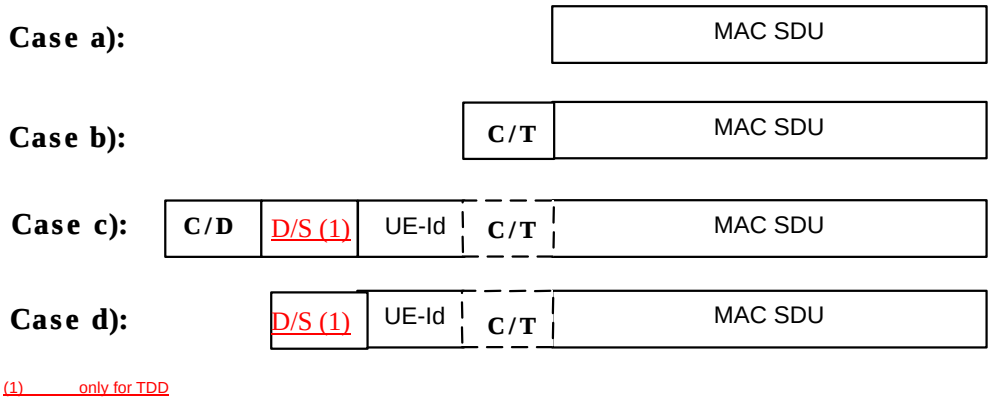


Figure 9.2.2.1: MAC Data PDU formats for DTCH and DCCH