TSG-RAN Meeting #17 ***RP-020556***
Biarritz, France, 3 - 6 September 2002

Title: **Agreed CRs (Rel-5) to TS 25.321**

Source: **TSG-RAN WG2**

Agenda item: **7.2.5**

Doc-1st-	Status-	Spec	CR	Rev	Phase	Subject	Cat	Versio	Versio
R2-022339	agreed	25.321	123		Rel-5	Optional use of a maximum transmission delay for MAC-hs SDUs	F	5.1.0	5.2.0
R2-022340	agreed	25.321	124		Rel-5	MAC-hs: Scheduler and HARQ entity functions for TSN	F	5.1.0	5.2.0
R2-022342	agreed	25.321	125		Rel-5	Corrections on C/T field definition for HS-DSCH	F	5.1.0	5.2.0
R2-022343	agreed	25.321	126		Rel-5	MAC re-ordering entity	F	5.1.0	5.2.0
R2-022344	agreed	25.321	127		Rel-5	Limiting of number of PDUs in a TTI	F	5.1.0	5.2.0
R2-022439	agreed	25.321	134		Rel-5	Signalling of Transport Block Sizes for HS-DSCH	F	5.1.0	5.2.0
R2-022440	agreed	25.321	135		Rel-5	Transport block size signalling 3.84 Mcps TDD	F	5.1.0	5.2.0
R2-022441	agreed	25.321	136		Rel-5	Transport block size signalling 1.28 Mcps TDD	F	5.1.0	5.2.0

3GPP TSG-RAN WG2 #31
Arlanda, Sweden, 19-23 August 2002

Tdoc ⌘R2-022339

CR-Form-v7

CHANGE REQUEST

⌘ **25.321** **CR** **123** ⌘ **rev** **-** ⌘ Current version: **5.1.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ [ ] ME [X] Radio Access Network [X] Core Network [ ]

Title:	⌘	Optional use of a maximum transmission delay for MAC-hs SDUs
Source:	⌘	TSG-RAN WG2
Work item code:	⌘	HSDPA-L23
Date:	⌘	19/08/2002
Category:	⌘	**F**
Release:	⌘	Rel-5

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
Rel-4 (Release 4)
Rel-5 (Release 5)
Rel-6 (Release 6)

Reason for change:	⌘	In RAN2#30, based on discussion on R2-021628, it was agreed to ask RAN3 to add a delay attribute to RNSAP and NBAP, so that the Node B could discard any 'out-of-date' MAC-hs SDUs.
Summary of change:	⌘	It is specified that the MAC-hs scheduler may discard some MAC-hs SDU based on this delay attribute. Detail used are left to UTRAN implementation.
Consequences if not approved:	⌘	Imcomplete description of HSDPA: use of the RNSAP and NBAP delay attribute IE won't be mentionned in the MAC specification.

Clauses affected:	⌘	11.6.1.1			
		Y	**N**		
Other specs affected:	⌘		X	Other core specifications	⌘
			X	Test specifications	
			X	O&M Specifications	
Other comments:	⌘				

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downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

11.6.1 Network operation

The following are the functions of the various functional entities at the network in support of the HARQ protocol used on HS-DSCH.

11.6.1.1 Scheduler

The scheduler performs the following functions:

- Schedules all UEs within a cell;
- Services priority queues:
  - The scheduler schedules MAC-hs SDUs based on information from ~~the Iub frame protocol~~upper layers. One UE may be associated with one or more MAC-d flows. Each MAC-d flow contains HS-DSCH MAC-d PDUs for one or more priority queues.
- Determines the HARQ Entity and the queue to be serviced;
- Indicates the Queue ID and TSN to the HARQ entity for each MAC-hs PDU to be transmitted;
- Schedules new transmissions and retransmissions:
  - Based on the status reports from HARQ Processes the scheduler determines if either a new transmission or a retransmission should be made. A new transmission can however be initiated on a HARQ process at any time. Based on a delay attribute provided by ~~the Iub control plane~~upper layers, the scheduler may decide to discard any 'out-of-date' MAC-hs SDU.
- Determines the redundancy version:
  - The scheduler determines a suitable redundancy version for each transmitted and retransmitted MAC-hs PDU and indicates the redundancy version to lower layer.

11.6.1.2 HARQ entity

- There is one HARQ entity per UE in UTRAN.
- The HARQ entity sets the Queue ID in transmitted MAC-hs PDUs. UTRAN should:
  - set the Queue ID based on the identity of the queue being serviced.
- The HARQ entity sets the transmission sequence number (TSN) in transmitted MAC-hs PDUs. UTRAN should:
  - set the TSN to value 0 for the first MAC-hs PDU transmitted for one HS-DSCH and Queue ID;
  - increment the TSN with one for each transmitted MAC-hs PDU on a HS-DSCH and Queue ID.
- The HARQ entity sets the HARQ process identifier in transmitted MAC-hs PDUs. UTRAN should:
  - determine a suitable HARQ process to service the MAC-hs PDU and set the HARQ process identifier accordingly.

11.6.1.3 HARQ process

- The HARQ process sets the New data indicator in transmitted MAC-hs PDUs. UTRAN should:
  - set the New Data Indicator to the value "0" for the first MAC-hs PDU transmitted by a HARQ process;
  - not increment the New Data Indicator for subsequent transmissions of a MAC-hs PDU;
  - increment the New Data Indicator with one for each transmitted MAC-hs PDU containing new data.
- The HARQ process processes received status messages. UTRAN should:
  - deliver received status messages to the scheduler.

3GPP TSG-RAN WG2 #31
Arlanda, Sweden, 19-23 August 2002

Tdoc ⌘R2-022340

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CHANGE REQUEST

⌘ **25.321** **CR** **124** ⌘ **rev** **-** ⌘ Current version: **5.1.0** ⌘

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Proposed change affects: UICC apps⌘ ☐ ME ☒ Radio Access Network ☒ Core Network ☐

Title:	⌘	MAC-hs: Scheduler and HARQ entity functions for TSN
Source:	⌘	TSG-RAN WG2
Work item code:	⌘	HSDPA-L23
Date:	⌘	19/08/2002
Category:	⌘	**F**
Release:	⌘	REL-5

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D *(editorial modification)*
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R99 (Release 1999)
Rel-4 (Release 4)
Rel-5 (Release 5)
Rel-6 (Release 6)

Summary of change: ⌘

At RAN2#30 in Turin, it was agreed to clean up 25.308 based on some of the mis-alignments and corrections highlighted in R2-021639.

Regarding the proper specification of the functions of the MAC-hs scheduler and HARQ entity, changes are also need to 25.321 and are included in this change request.

At RAN2#30, it was agreed that the scheduler functionality should include the selection of the Queue for the HS-DSCH and set the TSN value for the data block that is subsequently forwarded to the HARQ entity. The Queue ID and the assigned TSN value is then indicated to the HARQ entity. The HARQ entity is then responsible for the inclusion of these indicated values into the correct fields within the transmitted MAC-hs PDU. Currently the description appears to state that the HARQ entity should be settoing the TSN value based on some rules (first PDU and previous TSN values) but in fact this value is sent to the HARQ entity from the scheduler and it is the scheduler that uses these rules to 'set' the TSN value.

This CR implements the understanding above into the relevant sections of 25.321.

Subsection 11.6.1.1 (scheduler):
- Include the functionality of setting the TSN and incrementing the TSN with one for each transmitted MAC-hs PDU on each Queue ID within an HS-DSCH.

Subsection 11.6.1.2 (HARQ entity):

- Include the functionality that the HARQ entity sets the Queue ID based in the

		transmitted MAC-hs PDUs to the value indicated by the scheduler - Include the functionality that the HARQ entity sets the TSN in the transmitted MAC-hs PDU to the value indicated by the scheduler
Consequences if not approved:	⌘	Incorrect specificaiton of correction functions associated with scheduler and HARQ entity;

Clauses affected:	⌘	11.6.1.1, 11.6.1.2				
		Y	**N**			
Other specs Affected:	⌘		**X**	Other core specifications	⌘	
			X	Test specifications		
			X	O&M Specifications		
Other comments:	⌘					

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11.6.1 Network operation

The following are the functions of the various functional entities at the network in support of the HARQ protocol used on HS-DSCH.

11.6.1.1 Scheduler

The scheduler performs the following functions:

- Schedules all UEs within a cell;
- Services priority queues:
  - The scheduler schedules MAC-hs SDUs based on information from the Iub frame protocol. One UE may be associated with one or more MAC-d flows. Each MAC-d flow contains HS-DSCH MAC-d PDUs for one or more priority queues.
- Determines the HARQ Entity and the queue to be serviced;
- Sets the TSN for ~~the~~ new data blocks being transferred from the selected queue;
  - set the TSN to value 0 for the first MAC-hs PDU transmitted for ~~one HS-DSCH and~~ each Queue ID within an HS-DSCH;
  - increment the TSN with one for each transmitted MAC-hs PDU on ~~a HS-DSCH and~~ each Queue ID within an HS-DSCH.
- Indicates the Queue ID and TSN to the HARQ entity for each MAC-hs PDU to be transmitted;
- Schedules new transmissions and retransmissions:
  - Based on the status reports from HARQ Processes the scheduler determines if either a new transmission or a retransmission should be made. A new transmission can however be initiated on a HARQ process at any time.
- Determines the redundancy version:
  - The scheduler determines a suitable redundancy version for each transmitted and retransmitted MAC-hs PDU and indicates the redundancy version to lower layer.

11.6.1.2 HARQ entity

- There is one HARQ entity per UE in UTRAN.
- The HARQ entity sets the Queue ID in transmitted MAC-hs PDUs to the value indicated by the ~~.~~ UTRAN scheduler~~should.:~~
  - ~~set the Queue ID based on the identity of the queue being serviced.~~
- The HARQ entity sets the transmission sequence number (TSN) in transmitted MAC-hs PDUs to the value indicated by the. UTRAN scheduler~~should.:~~
  - ~~set the TSN to value 0 for the first MAC-hs PDU transmitted for one HS-DSCH and Queue ID;~~
  - ~~increment the TSN with one for each transmitted MAC-hs PDU on a HS-DSCH and Queue ID.~~
- The HARQ entity sets the HARQ process identifier in transmitted MAC-hs PDUs. UTRAN should:
  - determine a suitable HARQ process to service the MAC-hs PDU and set the HARQ process identifier accordingly.

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3GPP TSG-RAN WG2 #31 ***R2-022342***
Stockholm, Sweden, 19th – 23rd August 2002

CR-Form-v7

CHANGE REQUEST

⌘ **25.321** **CR** **125** ⌘ **rev** **-** ⌘ Current version: **5.1.0** ⌘

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Proposed change affects: UICC apps⌘ [ ] ME [X] Radio Access Network [X] Core Network [ ]

Title:	⌘	Corrections on C/T field definition for HS-DSCH
Source:	⌘	TSG-RAN WG2
Work item code:	⌘	HSDPA-L23
Date:	⌘	21/08/2002
Category:	⌘	**F**
Release:	⌘	Rel-5

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
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C *(functional modification of feature)*
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Use one of the following releases:
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R99 (Release 1999)
Rel-4 (Release 4)
Rel-5 (Release 5)
Rel-6 (Release 6)

Reason for change:	⌘	In Rel99, one MAC-d flow is directly mapped to one transport channel, and the C/T field provides the identification of logical channels mapped onto the same transport channel. But in Rel5, to support HSDPA, a new functionality of MAC-hs multiplexing is introduced, and now one transport channel (HS-DSCH) can have several MAC-d flows. In this case, C/T field should provide the identification of logical channels mapped onto the same MAC-d flow not the same transport channel. Therefore, C/T field definition needs to be modified.
Summary of change:	⌘	The C/T field definition is changed as; The C/T field provides identification of the logical channel instance when multiple logical channels are carried on the same transport channel (other than HS-DSCH) or same MAC-d flow (HS-DSCH).
Consequences if not approved:	⌘	All logical channels mapped onto the same HS-DSCH share the common C/T field even though they are mapped onto the different MAC-d flows. HS-DSCH may lack of logical channel numbers.

Clauses affected:	⌘	4.2.3.2, 4.2.4.2, 9.2.1

Other specs affected: ⌘	Y	N		⌘
		X	Other core specifications	
		X	Test specifications	
		X	O&M Specifications	

Other comments: ⌘

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4.2.3.2 MAC-d entity – UE Side

Figure 4.2.3.2.1 shows the UE side MAC-d entity.

The following functionality is covered:

- Transport Channel type switching
  - Transport Channel type switching is performed by this entity, based on decision taken by RRC. This is related to a change of radio resources. If requested by RRC, MAC shall switch the mapping of one designated logical channel between common and dedicated transport channels.
- C/T MUX:
  - The C/T MUX is used when multiplexing of several dedicated logical channels onto one transport channel (other than HS-DSCH) or one MAC-d flow (HS-DSCH) is used. An unambiguous identification of the logical channel is included.
- Ciphering:
  - Ciphering for transparent mode data to be ciphered is performed in MAC-d. Details about ciphering can be found in [10].
- Deciphering:
  - Deciphering for ciphered transparent mode data is performed in MAC-d. Details about ciphering can be found in [10].
- UL TFC selection:
  - Transport format and transport format combination selection according to the transport format combination set (or transport format combination subset) configured by RRC is performed.

4.2.4.2 MAC-d entity – UTRAN Side

Figure 4.2.4.2.1 shows the UTRAN side MAC-d entity.

The following functionality is covered:

- Transport Channel type switching:
  - Transport Channel type switching is performed by this entity, based on decision taken by RRC; this is related to a change of radio resources. If requested by RRC, MAC shall switch the mapping of one designated logical channel between common and dedicated transport channels.
- C/T MUX box;
  - the function includes the C/T field when multiplexing of several dedicated logical channels onto one transport channel (other than HS-DSCH) or one MAC-d flow (HS-DSCH) is used.
- Priority setting;
  - This function is responsible for priority setting on data received from DCCH / DTCH;
- Ciphering;
  - Ciphering for transparent mode data to be ciphered is performed in MAC-d. Details about ciphering can be found in [10].
- Deciphering;

  - Deciphering for ciphered transparent mode data is performed in MAC-d. Details about ciphering can be found in [10].

- DL Scheduling/Priority handling;

  - in the downlink, scheduling and priority handling of transport channels is performed within the allowed transport format combinations of the TFCS assigned by the RRC.

- Flow Control;

  - a flow control function exists toward MAC-c/sh to limit buffering between MAC-d and MAC-c/sh entities. This function is intended to limit layer 2 signalling latency and reduce discarded and retransmitted data as a result of FACH or DSCH congestion. For the Iur interface this is specified in [11]. A flow control function also exists towards MAC-hs in case of configuration without MAC-c/sh, see subclause 4.2.4.2.

9.2.1 MAC PDU: Parameters of the MAC PDU header (non HS-DSCH) and MAC-d PDU header (HS-DSCH)

The following fields are defined for the MAC header for transport channels other than HS-DSCH and for the MAC-d PDU header for HS-DSCH:

- Target Channel Type Field
  The TCTF field is a flag that provides identification of the logical channel class on FACH and RACH transport channels, i.e. whether it carries BCCH, CCCH, CTCH, SHCCH or dedicated logical channel information. The size and coding of TCTF for FDD and TDD are shown in tables 9.2.1.1, 9.2.1.2, 9.2.1.3, 9.2.1.4 and 9.2.1.5. Note that the size of the TCTF field of FACH for FDD is either 2 or 8 bits depending of the value of the 2 most significant bits and for TDD is either 3 or 5 bits depending on the value of the 3 most significant bits. The TCTF of the RACH for TDD is either 2 or 4 bits depending on the value of the 2 most significant bits.

Table 9.2.1.1: Coding of the Target Channel Type Field on FACH for TDD

TCTF	Designation
000	BCCH
001	CCCH
010	CTCH
01100	DCCH or DTCH over FACH
01101-01111	Reserved (PDUs with this coding will be discarded by this version of the protocol)
100	SHCCH
101-111	Reserved (PDUs with this coding will be discarded by this version of the protocol)

Table 9.2.1.2: Coding of the Target Channel Type Field on FACH for FDD

TCTF	Designation
00	BCCH
01000000	CCCH
01000001-01111111	Reserved (PDUs with this coding will be discarded by this version of the protocol)
10000000	CTCH
10000001-10111111	Reserved (PDUs with this coding will be discarded by this version of the protocol)
11	DCCH or DTCH over FACH

Table 9.2.1.3: Coding of the Target Channel Type Field on USCH or DSCH (TDD only)

TCTF	Designation
0	SHCCH
1	DCCH or DTCH over USCH or DSCH

Table 9.2.1.4: Coding of the Target Channel Type Field on RACH for FDD

TCTF	Designation
00	CCCH
01	DCCH or DTCH over RACH
10-11	Reserved (PDUs with this coding will be discarded by this version of the protocol)

Table 9.2.1.5: Coding of the Target Channel Type Field on RACH for TDD

TCTF	Designation
00	CCCH
0100	DCCH or DTCH Over RACH
0101-0111	Reserved (PDUs with this coding will be discarded by this version of the protocol)
10	SHCCH
11	Reserved (PDUs with this coding will be discarded by this version of the protocol)

- 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 (other than HS-DSCH) or same MAC-d flow (HS-DSCH). 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 is fixed to 4 bits for both common transport channels and dedicated transport channels. Table 9.2.1.5a shows the 4-bit C/T field.

Table 9.2.1.5a: Structure of the C/T field

C/T field	Designation
0000	Logical channel 1
0001	Logical channel 2
...	...
1110	Logical channel 15
1111	Reserved (PDUs with this coding will be discarded by this version of the protocol)

- UE-Id
  The UE-Id field provides an identifier of the UE on common transport channels. The following types of UE-Id used on MAC are defined:

  - UTRAN Radio Network Temporary Identity (U-RNTI) may be used in the MAC header of DCCH when mapped onto common transport channels in downlink direction; the U-RNTI is never used in uplink direction;

  - Cell Radio Network Temporary Identity (C-RNTI) is used on DTCH and DCCH in uplink, and may be used on DCCH in downlink and is used on DTCH in downlink when mapped onto common transport channels, except when mapped onto DSCH transport channel;

  - In FDD, DSCH Radio Network Temporary Identity (DSCH-RNTI) is used on DTCH and DCCH in downlink when mapped onto DSCH transport channel;- the UE id to be used by MAC is configured through the MAC control SAP. The lengths of the UE-id field of the MAC header are given in table 9.2.1.6.

Table 9.2.1.6: Lengths of UE Id field

UE Id type	Length of UE Id field
U-RNTI	32 bits
C-RNTI	16 bits
DSCH-RNTI	16 bits

- UE-Id Type
  The UE-Id Type field is needed to ensure correct decoding of the UE-Id field in MAC Headers.

Table 9.2.1.7: UE-Id Type field definition

UE-Id Type field 2 bits	UE-Id Type
00	U-RNTI
01	C-RNTI or DSCH-RNTI
10	Reserved (PDUs with this coding will be discarded by this version of the protocol)
11	Reserved (PDUs with this coding will be discarded by this version of the protocol)

3GPP TSG-RAN2 Meeting #31
Arlanda, Sweden, 19/8/2002

Tdoc ⌘R2-022343

CR-Form-v7

CHANGE REQUEST

⌘ **25.321** **CR** **126** ⌘ **rev** **-** ⌘ Current version: **5.1.0** ⌘

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Proposed change affects: UICC apps⌘ [ ] ME [X] Radio Access Network [X] Core Network [ ]

Title:	⌘	Corrections to re-ordering protocol description
Source:	⌘	TSG-RAN WG2
Work item code:	⌘	HSDPA-L23
Date:	⌘	22/06/2002
Category:	⌘	**F**
Release:	⌘	REL-5

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
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R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*

Reason for change:	⌘	The specification is incomplete
Summary of change:	⌘	Completed the description of what should be done when the timer expires. Clarified what the set of PDUs that is to be delivered to higher layers is. Clarified that setting the value of next_expected_TSN is mandatory. Clarified that TSN<=SN-WINDOW implies that the TSN is outside the receiver window.
Consequences if not approved:	⌘	Unclear specification

Clauses affected:	⌘	11.6.2.3.1			
Other specs affected:	⌘	**Y**	**N**		
			X	Other core specifications	⌘
			X	Test specifications	
			X	O&M Specifications	
Other comments:	⌘				

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11.6.2.3 Reordering entity

11.6.2.3.1 Definitions

In the functions described in this section the following definitions apply:

- Next_expected_TSN:
  The next_expected_TSN is the Transmission sequence number (TSN) following the TSN of the last in-sequence MAC-hs PDU received. It shall be updated upon the receipt of the MAC-hs PDU with TSN equal to Next_expected_TSN. The initial value of Next_expected_TSN =0.

- Transmitter window:
  The transmitter window defines which MAC-hs PDUs that the transmitter can retransmit without causing an ambiguity of the TSN in the receiver. The size of the transmitter window equals WINDOW and the maximum value of WINDOW is 32. The initial transmitter window equals [0..31]. The configuration of WINDOW by higher layers is FFS.

- Receiver window:
  The receiver window defines which MAC-hs PDUs that can be received in the receiver without causing an advancement of the receiver window according to the procedure below. The size of the receiver window equals WINDOW and the maximum value of WINDOW is 32. The initial receiver window equals [0..31]. The configuration of WINDOW by higher layers is FFS.

The timer T1 controls the stall avoidance in the UE reordering buffer. The value of T1 is configured by upper layers.

If no timer T1 is active:

- the timer T1 shall be started when a MAC-hs PDU with TSN=SN is correctly received but can not be delivered to the disassembly function due to that the MAC-hs PDU with TSN equal to Next_expected_TSN is missing.

If a timer T1 is already active:

- no additional timer shall be started, i.e. only one timer T1 may be active at a given time.

The timer T1 shall be stopped if:

- the MAC-hs PDU for which the timer was started can be delivered to the disassembly function before the timer expires.

When the timer T1expires:

- all correctly received MAC-hs PDUs up to and including SN-1 shall be delivered to the disassembly function and they shall be removed from the reordering buffer and be considered as having been received;

- all correctly received MAC-hs PDUs up to the ~~first~~ next missing MAC-hs PDU shall be delivered to the disassembly function.

When the timer T1 is stopped or expires, and there still exist some received MAC-hs PDUs that can not be delivered to higher layer:

- timer T1 is started for the MAC-hs PDU with highest TSN among those MAC-hs PDUs that can not be delivered.

Transmitter operation:

After the transmitter has transmitted a MAC-hs PDU with TSN=SN, any MAC-hs PDU with TSN ≤ SN – WINDOW should not be retransmitted to avoid sequence number ambiguity in the receiver. A MAC-hs PDU that has been aborted by the transmitter after ~~being~~ having been transmitted one or more times, should not be retransmitted after it has been aborted.

Receiver operation:

- If the soft buffers in all the HARQ processes are empty (i.e. no data in the buffers exists that will be soft combined with later received data):

- all correctly received MAC-hs PDUs shall be delivered to the disassembly function and be removed from the reordering buffer; and
- these MAC-hs PDUs shall be considered as having beening received in the following procedure.

- MAC-hs PDUs that have been discarded by the timer- based mechanism shall be considered as having beening received in the following procedure.

When a MAC-hs PDU with TSN = SN is received:

- If SN is within the receiver window and this MAC-hs PDU has not previously been received:
  - the MAC-hs PDU is placed in the reordering buffer at the place indicated by the TSN.
- If SN is within the receiver window, and this MAC-hs PDU has been previously received:
  - the MAC-hs PDU shall be discarded.
- If SN is outside the receiver window:
  - the received MAC-hs PDU shall be placed above the highest received TSN in the reordering buffer, at the position indicated by SN;
  - the receiver window shall be advanced so that SN forms the upper edge of the receiver window;
  - any MAC-hs PDUs with TSN ≤ SN – WINDOW, i.e. outside the receiver window after its position is updated, shall be removed from the reordering buffer and be delivered to the disassembly entity.
- All received MAC-hs PDUs with consecutive TSNs from next_expected_TSN up to the first not received MAC-hs PDU are delivered to the disassembly entity.
- next_expected_TSN shall be set to Tthe TSN of this first not received MAC-hs PDU becomes the next_expected_TSN.

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Arlanda, Sweden, 19/08/2002

Tdoc ⌘R2-022344

CR-Form-v7

CHANGE REQUEST

⌘ **25.321** **CR** **127** ⌘ **rev** **-** ⌘ Current version: **5.1.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ ☐ ME ☒ Radio Access Network ☒ Core Network ☐

Title:	⌘	Limiting of number of PDUs per TTI
Source:	⌘	TSG-RAN WG2
Work item code:	⌘	HSDPA-L23
Date:	⌘	13/08/2002
Category:	⌘	**F**
Release:	⌘	Rel-5

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*

Reason for change:	⌘	From a UE complexity point of view it is useful to provide a cap to the number of PDUs that could be received in a TTI.
Summary of change:	⌘	Specified the maximum number of PDUs that can be expected in a single TTI and that the UE behaviour is unspecified if this number is for any reason exceeded. Modified one of the values of the flag so that the two possible behaviours correspond to different value.
Consequences if not approved:	⌘	Added complexity and therefore cost in UE implementations.

Clauses affected:	⌘	9.2.2			
Other specs affected:	⌘	**Y**	**N**		
			N	Other core specifications	⌘
			N	Test specifications	
			N	O&M Specifications	
Other comments:	⌘				

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.htm.
Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

9.2.2 MAC PDU: Parameters of the MAC header (HS-DSCH)

- Version Flag (VF):
  The VF field is a one bit flag providing extension capabilities of the MAC-hs PDU format. The VF field shall be set to zero and the value one is reserved in this version of the protocol.

- Queue identifier (Queue ID):
  The Queue ID field provides identification of the reordering queue in the receiver, in order to support independent buffer handling of data belonging to different reordering queues. The length of the Queue ID field is 3 bit.

- Transmission Sequence Number (TSN):
  The TSN field provides an identifier for the transmission sequence number on the HS-DSCH. The TSN field is used for reordering purposes to support in-sequence delivery to higher layers. The length of the TSN field is 6 bit.

- Size index identifier (SID):
  The SID fields identifies the size of a set of consecutive MAC-d PDUs. The MAC-d PDU size for a given SID is configured by higher layers and is independent for each Queue ID. The length of the SID field is 3 bit.

- Number of MAC-D PDUs (N):
  The number of consecutive MAC-d PDUs with equal size is identified with the N field. The length of the N field is 7 bits. In FDD mode, the maximum number of PDUs transmitted in a single TTI shall be assumed to be 70. If more PDUs are received, the UE behaviour is unspecified.

- Flag (F):
  The F field is a flag indicating if more SID fields are present in the MAC-hs header or not. If the F field is set to "0" the F field is followed by a SID field. If the F field is set to "1" the F field is followed by a MAC-d PDU.

9.2.2.1 MAC header for DTCH and DCCH

a) DTCH or DCCH mapped to HS-DSCH:

   - The Queue ID field and TSN field are always included in the MAC-hs header. One SID field, N field and F field is included for each MAC-d PDU size included in the MAC-hs PDU. Padding is not explicitly indicated but is included in the end of the MAC-hs PDU if the total size of the MAC-hs payload is smaller than the transport block set size.

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Arlanda, Sweden, 19-23 August 2002

Tdoc R2-022439

CR-Form-v4

CHANGE REQUEST

⌘ **25.321 CR 134** ⌘ ev **-** ⌘ Current version: **5.1.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘ (U)SIM ☐ ME/UE **X** Radio Access Network **X** Core Network ☐

Title:	⌘	Signaling of Transport Block Sizes for HS-DSCH
Source:	⌘	TSG-RAN WG2
Work item code:	⌘	HSDPA-L23
Date:	⌘	2002-08-23
Category:	⌘	**F**
Release:	⌘	REL-5

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
REL-4	*(Release 4)*
REL-5	*(Release 5)*

Reason for change:	⌘	The signaling of transport block sizes for HS-DSCH is currently not defined.
Summary of change:		Potential mapping of the TFRI value signaled on the HS-SCCH to TB size for HS-DSCH is discussed in R2-020985. This CR introduces a formula which gives a TB size from a signalled TFRI value according to the conclusions in R2-020985.
Consequences if not approved:	⌘	Incomplete specification

Clauses affected:	⌘	8.11, 8.12, 9.2.3 (new sections)
Other specs affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications
	⌘	
Other comments:	⌘	

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3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

8 Elements for layer-to-layer communication

The interaction between the MAC layer and other layers are described in terms of primitives where the primitives represent the logical exchange of information and control between the MAC layer and other layers. The primitives shall not specify or constrain implementations. The MAC is connected to layer 1, RLC and RRC. The following subclauses describe the primitives between these layers.

8.1 Primitives between layers 1 and 2

8.1.1 Primitives

The primitives are described in [3].

8.1.2 Parameters

a) Transport Format Resource Indicator (TFRI) for HS-DSCH

- For HS-DSCH the Transport Block size is derived from the TFRI value signalled on the HS-SCCH. The mapping between TFRI value and Transport Block size is specified in subclause 9.2.3.

8.2 Primitives between MAC and RLC

8.2.1 Primitives

The primitives between MAC layer and RLC layer are shown in table 8.2.1.1.

Table 8.2.1.1: Primitives between MAC layer and RLC layer

Generic Name	Parameter			
	Request	Indication	Response	Confirm
MAC-DATA	Data, BO, UE-ID type indicator, RLC Entity Info	Data, No_TB, TD (note), Error indication		
MAC-STATUS		No_PDU, PDU_Size, TX status	BO, RLC Entity Info	
NOTE: TDD only.				

MAC-DATA-Req/Ind:

- MAC-DATA-Req primitive is used to request that an upper layer PDU be sent using the procedures for the information transfer service;

- MAC-DATA-Ind primitive indicates the arrival of upper layer PDUs received within one transmission time interval by means of the information transfer service.

MAC-STATUS-Ind/Resp:

- MAC-STATUS-Ind primitive indicates to RLC for each logical channel the rate at which it may transfer data to MAC. Parameters are the number of PDUs that can be transferred in each transmission time interval and the PDU size; it is possible that MAC would use this primitive to indicate that it expects the current buffer occupancy of the addressed logical channel in order to provide for optimised TFC selection on transport channels with long transmission time interval. At the UE, MAC-STATUS-Ind primitive is also used to indicate from MAC to RLC that MAC has requested data transmission by PHY (i.e. PHY-DATA-REQ has been submitted, see Fig. 11.2.2.1), or that transmission of an RLC PDU on RACH or CPCH has failed due to exceeded preamble ramping cycle counter.

- MAC-STATUS-Resp primitive enables RLC to acknowledge a MAC-STATUS-Ind. It is possible that RLC would use this primitive to indicate that it has nothing to send or that it is in a suspended state or to indicate the current buffer occupancy to MAC.

8.2.2 Parameters

a) Data:

- it contains the RLC layer messages (RLC-PDU) to be transmitted, or the RLC layer messages that have been received by the MAC sub-layer.

b) Number of transmitted transport blocks (No_TB) :

- indicates the number of transport blocks transmitted by the peer entity within the transmission time interval, based on the TFI value.

c) Buffer Occupancy (BO):

- the parameter Buffer Occupancy (BO) indicates for each logical channel the amount of data in number of bytes that is available for transmission and retransmission in RLC layer. When MAC is connected to an AM RLC entity, control PDUs to be transmitted and RLC PDUs outside the RLC Tx window shall also be included in the BO. RLC PDUs that have been transmitted but not negatively acknowledged by the peer entity shall not be included in the BO.

d) RX Timing Deviation (TD), TDD only:

- it contains the RX Timing Deviation as measured by the physical layer for the physical resources carrying the data of the Message Unit. This parameter is optional and only for Indication. It is needed for the transfer of the RX Timing Deviation measurement of RACH transmissions carrying CCCH data to RRC.

e) Number of PDU (No_PDU):

- specifies the number of PDUs that the RLC is permitted to transfer to MAC within a transmission time interval.

f) PDU Size (PDU_Size):

- specifies the size of PDU that can be transferred to MAC within a transmission time interval.

g) UE-ID Type Indicator:

- indicates the UE-ID type to be included in MAC for a DCCH and DTCH when they are mapped onto a common transport channel (i.e. FACH, RACH, DSCH in FDD or CPCH). On the UE side UE-ID Type Indicator shall always be set to C-RNTI.

h) TX status:

- when set to value "transmission unsuccessful" this parameter indicates to RLC that transmission of an RLC PDU failed in the previous Transmission Time Interval, when set to value "transmission successful" this parameter indicates to RLC that the requested RLC PDU(s) has been submitted for transmission by the physical layer.

i) RLC Entity Info

- indicates to MAC the configuration parameters that are critical to TFC selection depending on its mode and the amount of data that could be transmitted at the next TTI. This primitive is meant to insure that MAC can perform TFC selection (see subclause 11.4).

j) Error indication

- When a MAC SDU is delivered to upper layer, an error indication is given for the SDU to upper layer if an error indication for the SDU has been received from lower layer.

9.2.3 Signalling of Transport Block size for HS-DSCH

For HS-DSCH the transport block size is derived from the TFRI value signalled on the HS-SCCH. The mapping between the TFRI value and the transport block size for FDD is specified below:

For each combination of channelization code set and modulation scheme i = 0..31, a set of k_i = 0..63 transport block sizes $L(i, k_i)$ is given by:

If $i = 0$ and $k_i < 39$

$$L(i,k_i) = 137 + 12k_i$$
$$k_i = 0,...,38$$

else

$$L(i,k_i) = \left\lfloor L_{\min} p^{k_{0,i}+k_i} \right\rfloor$$
$$p = 2085/2048$$
$$L_{\min} = 296$$
$$k_{0,i} = \text{from Table } 9.2.3.1$$
$$k_i = 0,...,63$$

end

Note that the if statement above is true only for a single channelization code using QPSK modulation. The index k_i of the transport block size $L(i, k_i)$ corresponds to the 6 bit transport block size index signaled on the HS-SCCH. The index i corresponds to the combination of channelization code set and modulation scheme as defined in Table 9.2.3.1.

Table 9.2.3.1: Values of $k_{0,i}$ for different numbers of channelization codes and modulation schemes

Combination i	Modulation scheme	Number of channelization codes	$k_{0,i}$
0	QPSK	1	1
1		2	40
2		3	63
3		4	79
4		5	92
5		6	102
6		7	111
7		8	118
8		9	125
9		10	131
10		11	136
11		12	141
12		13	145
13		14	150
14		15	153
15	16QAM	1	40
16		2	79
17		3	102
18		4	118
19		5	131
20		6	141
21		7	150
22		8	157

23		9	164
24		10	169
25		11	175
26		12	180
27		13	184
28		14	188
29		15	192

3GPP TSG-RAN WG2 Meeting #31
Stockhom, Sweden, 19-23 August 2002

R2-022440

CR-Form-v7

CHANGE REQUEST

⌘ **25.321** **CR** **135** ⌘ **rev** **-** ⌘ Current version: **5.1.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ [ ] ME [X] Radio Access Network [X] Core Network [ ]

Title:	⌘	Transport block size signalling 3.84 Mcps TDD
Source:	⌘	TSG-RAN WG2
Work item code:	⌘	HSDPA-L23
Date:	⌘	15/08/02
Category:	⌘	**F**
Release:	⌘	Rel-5

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*

Reason for change:	⌘	Specification does not currently include the method for mapping transport block size field index value to TB size for HCR TDD HSDPA.
Summary of change:	⌘	
Consequences if not approved:	⌘	There will be no method in HCR TDD of converting from index value in the transport block size field to actual HS-DSCH TB size

Clauses affected:	⌘	8.1 and 9.2

	Y	N		
Other specs affected: ⌘		X	Other core specifications	⌘
		X	Test specifications	
		X	O&M Specifications	

Other comments: ⌘

How to create CRs using this form:
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3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

8.1 Primitives between layers 1 and 2

8.1.1 Primitives

The primitives are described in [3].

8.1.2 Parameters

a) Transport Format Resource Indicator (TFRI) for HS-DSCH

- For HS-DSCH the Transport Block size is derived from the TFRI value signalled on the HS-SCCH. The mapping between TFRI value and Transport Block size is specified in subclause 9.2.3.

9.2 Formats and parameters

NOTE: MAC header field encodings as specified in this clause with designation "Reserved" are forbidden to be used by a sender in this version of the protocol.

9.2.1 MAC PDU: Parameters of the MAC PDU header (non HS-DSCH) and MAC-d PDU header (HS-DSCH)

The following fields are defined for the MAC header for transport channels other than HS-DSCH and for the MAC-d PDU header for HS-DSCH:

- Target Channel Type Field
  The TCTF field is a flag that provides identification of the logical channel class on FACH and RACH transport channels, i.e. whether it carries BCCH, CCCH, CTCH, SHCCH or dedicated logical channel information. The size and coding of TCTF for FDD and TDD are shown in tables 9.2.1.1, 9.2.1.2, 9.2.1.3, 9.2.1.4 and 9.2.1.5. Note that the size of the TCTF field of FACH for FDD is either 2 or 8 bits depending of the value of the 2 most significant bits and for TDD is either 3 or 5 bits depending on the value of the 3 most significant bits. The TCTF of the RACH for TDD is either 2 or 4 bits depending on the value of the 2 most significant bits.

Table 9.2.1.1: Coding of the Target Channel Type Field on FACH for TDD

TCTF	Designation
000	BCCH
001	CCCH
010	CTCH
01100	DCCH or DTCH over FACH
01101-01111	Reserved (PDUs with this coding will be discarded by this version of the protocol)
100	SHCCH
101-111	Reserved (PDUs with this coding will be discarded by this version of the protocol)

Table 9.2.1.2: Coding of the Target Channel Type Field on FACH for FDD

TCTF	Designation
00	BCCH
01000000	CCCH
01000001-01111111	Reserved (PDUs with this coding will be discarded by this version of the protocol)
10000000	CTCH
10000001-10111111	Reserved (PDUs with this coding will be discarded by this version of the protocol)
11	DCCH or DTCH over FACH

Table 9.2.1.3: Coding of the Target Channel Type Field on USCH or DSCH (TDD only)

TCTF	Designation
0	SHCCH
1	DCCH or DTCH over USCH or DSCH

Table 9.2.1.4: Coding of the Target Channel Type Field on RACH for FDD

TCTF	Designation
00	CCCH
01	DCCH or DTCH over RACH
10-11	Reserved (PDUs with this coding will be discarded by this version of the protocol)

Table 9.2.1.5: Coding of the Target Channel Type Field on RACH for TDD

TCTF	Designation
00	CCCH
0100	DCCH or DTCH Over RACH
0101-0111	Reserved (PDUs with this coding will be discarded by this version of the protocol)
10	SHCCH
11	Reserved (PDUs with this coding will be discarded by this version of the protocol)

- 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 is fixed to 4 bits for both common transport channels and dedicated transport channels. Table 9.2.1.5a shows the 4-bit C/T field.

Table 9.2.1.5a: Structure of the C/T field

C/T field	Designation
0000	Logical channel 1
0001	Logical channel 2
...	...
1110	Logical channel 15
1111	Reserved (PDUs with this coding will be discarded by this version of the protocol)

- UE-Id
  The UE-Id field provides an identifier of the UE on common transport channels. The following types of UE-Id used on MAC are defined:

  - UTRAN Radio Network Temporary Identity (U-RNTI) may be used in the MAC header of DCCH when mapped onto common transport channels in downlink direction; the U-RNTI is never used in uplink direction;

  - Cell Radio Network Temporary Identity (C-RNTI) is used on DTCH and DCCH in uplink, and may be used on DCCH in downlink and is used on DTCH in downlink when mapped onto common transport channels, except when mapped onto DSCH transport channel;

  - In FDD, DSCH Radio Network Temporary Identity (DSCH-RNTI) is used on DTCH and DCCH in downlink when mapped onto DSCH transport channel;- the UE id to be used by MAC is configured through the MAC control SAP. The lengths of the UE-id field of the MAC header are given in table 9.2.1.6.

Table 9.2.1.6: Lengths of UE Id field

UE Id type	Length of UE Id field
U-RNTI	32 bits
C-RNTI	16 bits
DSCH-RNTI	16 bits

- UE-Id Type
  The UE-Id Type field is needed to ensure correct decoding of the UE-Id field in MAC Headers.

Table 9.2.1.7: UE-Id Type field definition

UE-Id Type field 2 bits	UE-Id Type
00	U-RNTI
01	C-RNTI or DSCH-RNTI
10	Reserved (PDUs with this coding will be discarded by this version of the protocol)
11	Reserved (PDUs with this coding will be discarded by this version of the protocol)

9.2.1.1 MAC header for DTCH and DCCH (not mapped on HS-DSCH)

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:

- TCTF field, C/T field, UE-Id type field and UE-Id are included in the MAC header. For FACH, the UE-Id type field used is the C-RNTI or U-RNTI. For RACH, the UE-Id type field used is the C-RNTI.

d) DTCH or DCCH mapped to DSCH or USCH:

- the TCTF field is included in the MAC header for TDD only. The UE-Id type and UE-Id are included in the MAC header for FDD only. The UE-Id type field used is the DSCH-RNTI. The C/T field is included if multiplexing on MAC is applied.

e) DTCH or DCCH mapped to DSCH or USCH where DTCH or DCCH are the only logical channels:

- the UE-Id type and UE-Id are included in the MAC header for FDD only. The UE-Id type field used is the DSCH-RNTI. The C/T field is included in the MAC header if multiplexing on MAC is applied.

f) DTCH or DCCH mapped to CPCH:

- UE-Id type field and UE-Id are included in the MAC header. The C/T field is included in the MAC header if multiplexing on MAC is applied. The UE-Id type field used is the C-RNTI.

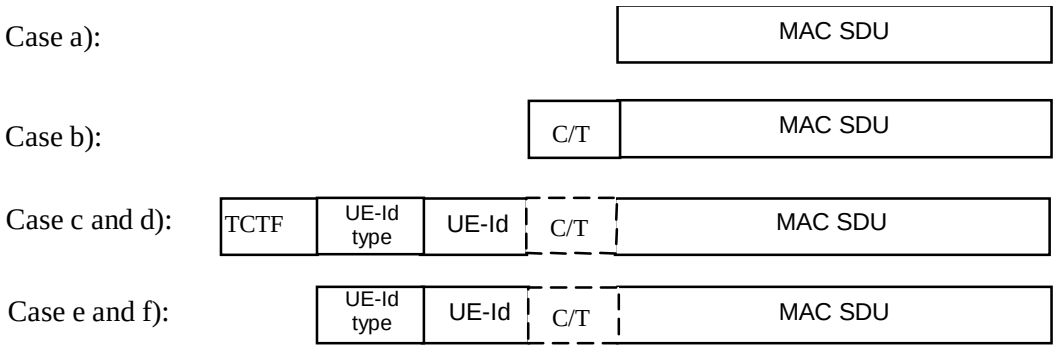

Figure 9.2.1.1.1: MAC PDU formats for DTCH and DCCH

9.2.1.1a MAC-d Header for DTCH and DCCH (mapped on HS-DSCH)

The MAC-d PDU header for DTCH and DCCH mapped on HS-DSCH is as shown in figure 9.2.1.1a.1.

- C/T field is included in the MAC-d PDU header if multiplexing on MAC is applied.

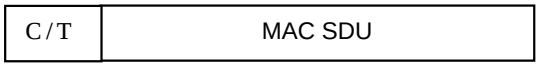

Figure 9.2.1.1a.1 MAC-d PDU format for DTCH and DCCH mapped on HS-DSCH

9.2.1.2 MAC header for BCCH

a) BCCH mapped to BCH:

- no MAC header is included.

b) BCCH mapped to FACH:

- the TCTF field is included in MAC header.

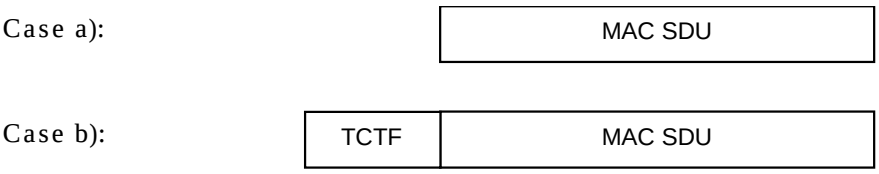

Figure 9.2.1.2.1: MAC PDU formats for BCCH

9.2.1.3 MAC header for PCCH

There is no MAC header for PCCH.

9.2.1.4 MAC header for CCCH

CCCH mapped to RACH/FACH:

- TCTF field is included in MAC header.

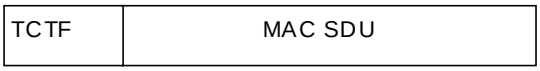

Figure 9.2.1.4.1: MAC PDU formats for CCCH

9.2.1.5 MAC Header for CTCH

The TCTF field is included as MAC header for CTCH as shown in figure 9.2.1.5.1.

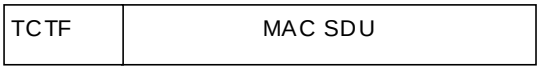

Figure 9.2.1.5.1: MAC PDU format for CTCH

9.2.1.6 MAC Header for SHCCH

The MAC header for SHCCH is as shown in figure 9.2.1.6.1.

a) SHCCH mapped to RACH and USCH/FACH and DSCH:

- TCTF has to be included.

b) SHCCH mapped to RACH and USCH/FACH and DSCH, where SHCCH is the only channel.

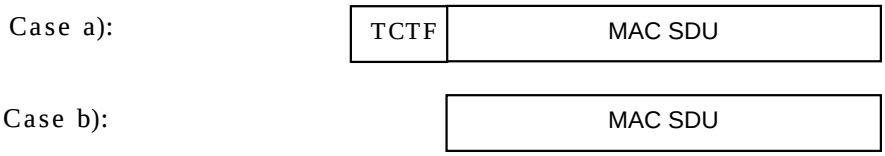

Figure 9.2.1.6.1: MAC PDU format for SHCCH

9.2.2 MAC PDU: Parameters of the MAC header (HS-DSCH)

- Version Flag (VF):
  The VF field is a one bit flag providing extension capabilities of the MAC-hs PDU format. The VF field shall be set to zero and the value one is reserved in this version of the protocol.

- Queue identifier (Queue ID):
  The Queue ID field provides identification of the reordering queue in the receiver, in order to support independent buffer handling of data belonging to different reordering queues. The length of the Queue ID field is 3 bit.

- Transmission Sequence Number (TSN):
  The TSN field provides an identifier for the transmission sequence number on the HS-DSCH. The TSN field is used for reordering purposes to support in-sequence delivery to higher layers. The length of the TSN field is 6 bit.

- Size index identifier (SID):
  The SID fields identifies the size of a set of consecutive MAC-d PDUs. The MAC-d PDU size for a given SID is configured by higher layers and is independent for each Queue ID. The length of the SID field is 3 bit.

- Number of MAC-D PDUs (N):
  The number of consecutive MAC-d PDUs with equal size is identified with the N field. The length of the N field is 7 bit.

- Flag (F):
  The F field is a flag indicating if more SID fields are present in the MAC-hs header or not. If the F field is set to "0" the F field is followed by a SID field. If the F field is set to "0" the F field is followed by a MAC-d PDU.

9.2.2.1 MAC header for DTCH and DCCH

a) DTCH or DCCH mapped to HS-DSCH:

   - The Queue ID field and TSN field are always included in the MAC-hs header. One SID field, N field and F field is included for each MAC-d PDU size included in the MAC-hs PDU. Padding is not explicitly indicated but is included in the end of the MAC-hs PDU if the total size of the MAC-hs payload is smaller than the transport block set size.

9.2.3 Signalling of Transport Block size for HS-DSCH

For HS-DSCH the transport block size is derived from the TFRI value signalled on the HS-SCCH. The mapping between the TFRI value and the transport block size for HCR TDD is specified below:

Let k be the signalled TFRI value, then the corresponding HS-DSCH transport block size L_k is given by :

If k=1..510

$$L_k = \lfloor L_{\min} p^k \rfloor$$

$$p = \frac{8313}{8192}$$

$$L_{\min} = 57$$

If k = 511

L_k = 102000

Note:

If k=0, L_k indicates NULL and shall not be used to signal a transport block size in the TFRI.

3GPP TSG-RAN WG2 Meeting #31
Stockhom, Sweden, 19-23 August 2002

R2-022441

CR-Form-v7

CHANGE REQUEST

⌘ **25.321** **CR** **136** ⌘ **rev** **-** ⌘ Current version: **5.1.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ [ ] ME [X] Radio Access Network [X] Core Network [ ]

Title:	⌘	Transport block size signalling 1.28 Mcps TDD
Source:	⌘	TSG-RAN WG2
Work item code:	⌘	HSDPA-L23
Date:	⌘	21/08/02
Category:	⌘	**F**
Release:	⌘	Rel-5

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*

Reason for change:	⌘	To include TFRI to HSDPA transport block size mapping for 1.28 Mcps TDD.
Summary of change:	⌘	A description of the transport block size mapping for 1.28 Mcps TDD is added to section 9.2.
Consequences if not approved:	⌘	

Clauses affected:	⌘	9.2

Other specs affected: ⌘	Y	N		⌘
		X	Other core specifications	
		X	Test specifications	
		X	O&M Specifications	

Other comments: ⌘

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.htm.
Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

9.2.3 Signalling of Transport Block Size for HS-DSCH

For HS-DSCH the transport block size is derived from the TFRI value signalled on the HS-SCCH. The mapping between the TFRI value and the transport block size for HCR TDD is specified below:

9.2.3.x Transport block size for 1.28 Mcps TDD

The mapping of transport block size, in bits, to TFRI value is dependent upon the UE's HS-DSCH capability class. The mapping between TFRI value, i, and the transport block size, L_i, is specified by the following:

L_0 = NULL i = 0,

$L_i = \left[10^{a+(i-1)(b-a)/62} \right]$ i = 1, 2, …,63

where

i = the transport block index,
$a = \log_{10}(TBS_{min})$,
$b = \log_{10}(TBS_{max})$,

and

TBS_{min} = 240,
TBS_{max} = the maximum transport block size that is supported by the UE class, which has the value

7016 for 1.4 Mb/s,
10204 for 2.0 Mbps and
14056 for 2.8 Mb/s.

It is noted that the NULL value (corresponding to index i = 0) is not signalled to the UE. It can be used by the UE in the Recommended Transport Block Size field of the CQI to signal that no available transport block size could have been used by the Node B to meet the specified target quality for the HS-DSCH.