3GPP TSG RAN Meeting #18 **RP-020851**
New Orleans, Louisiana, USA, 3 - 6 December, 2002

Title: **CRs (Rel-5) on Transport Block Size Signaling**

Source: **TSG-RAN WG1**

Agenda item: **7.1.6**

Release 5 CRs

CRs with links to RAN WG2 specifications

CRs on "Transport Block Size Signalling" (RP-020851)

No.	Spec	CR	Rev	WG T-doc	Subject	Phase	Cat	Workitem	V_old	V_new
1	25.214	304	2	R1-02-1455	Introduction of Transport Block Size signaling procedure reference.	REL-5	F	HSDPA-Phys	5.2.0	5.3.0
2	25.321	155	-	R2-023209	HSDPA Retransmission Block Size	REL-5	C	HSDPA-Phys	5.2.0	5.3.0

GPP TSG-RAN WG1 Meeting #29 *Tdoc ⌘R1-02-1455*

Shanghai, China, November 5th-8th 2002

CR-Form-v7

CHANGE REQUEST

⌘ **25.214** **CR** **304** ⌘ **rev** **2** ⌘ Current version: **5.2.0** ⌘

*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:	⌘	Introduction of Transport Block Size signaling procedure reference.
Source:	⌘	TSG RAN WG1
Work item code:	⌘	HSDPA -Phy
Date:	⌘	6/11/2002
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:	⌘	Introduction of Transport block size signalling procedure reference.
Summary of change:	⌘	Reference to the transport block size signalling procedure is introduced
Consequences if not approved:	⌘	Reference to the transport block size signalling procedure will be missing.

Clauses affected:	⌘	6A

		Y	N			
Other specs affected:	⌘		X	Other core specifications	⌘	25.321
				Test specifications		
				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.

6A HS-DSCH-related procedures

6A .1 General procedure

Scheduling and transport format selection is controlled by the MAC-hs sublayer in the Node B [9].

The following physical layer parameters are signalled to the UE and the Node B from higher layers:

1) HS-SCCH set to be monitored
2) Repetition factor of ACK/NACK: N_acknack_transmit
3) Channel Quality Indicator (CQI) feedback cycle *k*.
4) Repetition factor of CQI: N_cqi_transmit
5) Measurement power offset Γ

6A .1.1 UE procedure for receiving HS-DSCH

If the UE did not detect control information intended for this UE on any of the HS-SCCHs in the HS-SCCH set in the previous subframe, the UE shall monitor all HS-SCCHs in the HS-SCCH set. If the UE did detect control information intended for this UE in the previous subframe, it is sufficient to only monitor the same HS-SCCH used in the previous subframe.

If a UE detects that one of the monitored HS-SCCHs carries control information intended for this UE, the UE shall start receiving the HS-PDSCHs indicated by this control information.

The transport block size information shall be derived from the signaled TFRI value as defined in [9].

After decoding the HS-PDSCH data, the UE shall transmit an hybrid ARQ ACK or NACK as determined by the MAC-hs based on the CRC check. The UE shall repeat the transmission of the ACK/NACK information over *N_acknack_transmit* consecutive HS-DPCCH sub-frames, in the slots allocated to the HARQ-ACK as defined in [1]. When *N_ acknack_transmit* is greater than one, the UE shall not attempt to receive nor decode transport blocks from the HS-PDSCH in HS-DSCH sub-frames $n + 1$ to $n + (N\_acknack\_transmit - 1)$ where n is the number of the last HS-DSCH sub-frame in which a transport block has been received.

If control information is not detected on any of the HS-SCCHs in the HS-SCCH set, neither ACK, nor NACK, shall be transmitted in the corresponding subframe.

3GPP TSG-RAN WG2 Meeting #33 ***Tdoc ⌘R2-023209***
Sophia-Antipolis, France, 12 – 15 November 2002

CR-Form-v7

CHANGE REQUEST

⌘ **25.321** **CR** **155** ⌘ **rev** **-** ⌘ Current version: **5.2.0** ⌘

*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:	⌘	HSDPA Retransmission Block Size
Source:	⌘	TSG RAN WG2
Work item code:	⌘	HSDPA -Phy
Date:	⌘	11-11-02
Category:	⌘	**C**
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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Use one of the following releases:

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

Reason for change:	⌘	Changing the transport block size signalling procedure for retransmissions will allow flexibility at the Node-B in MCS selection and scheduling, resulting in improved HSDPA performance.
Summary of change:	⌘	For retransmisions, the Node-B is allowed to select a combination of CCS and modulation type that may not be supported by the transport block size selected for the first transmission. If at the time of retransmission, the Node-B selects a combination of CCS and modulation type which is not supported, then the transport block size index value signalled to the UE shall always be set to 111111.Otherwise it shall be set to a value according to the procedure defined in section 9.2.3.1
Consequences if not approved:	⌘	Current Transport block size signalling procedure limits selection of certain MCS combinations that may result in sub-optimal HSDPA performance.

Clauses affected:	⌘	9.2.3, 11.6.2			
Other specs affected:	⌘	Y / N	Other core specifications	⌘	25.214
		[ ] / [X]	Test specifications		
		[ ] / [X]	O&M Specifications		
Other comments:	⌘				

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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 each mode is specified below:

9.2.3.1 Transport block size for FDD

For all transmissions of a transport block, the transport block size is derived from the TFRI value as specified below, except only in those cases of retransmissions where the Node-B selects a combination for which no mapping exists between the original transport block size and the selected combination of channelisation Code set and modulation type. In such cases, the transport block size index value signalled to the UE shall be set to 111111, i.e., k_i=63.

For each combination of channelization code set and modulation scheme i = 0..31, a set of k_i = 0..623 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

$$L(i,k_i) = \left\lfloor L_{\min} \, p^{k_{0,i}+k_i} \right\rfloor$$
$$p = 2085/2048$$
$$L_{\min} = 296$$
$$k_{0,i} = \text{from Table 9.2.3.1}$$
$$k_i = 0,...,62$$

end

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

….

11.6.2 UE operation

The UE operation in support of the HARQ protocol used on HS-DSCH is split among the following four functional units with their associated functions.

11.6.2.1 HARQ Entity

- There is one HARQ entity at the UE which processes the HARQ process identifiers in received MAC-hs PDUs on HS-DSCH.
- Each received MAC-hs PDU shall be allocated to the HARQ process indicated by the HARQ process identifier of the MAC-hs PDU.

11.6.2.2 HARQ process

A number of parallel HARQ processes is used in the UE to support the HARQ protocol. The number of HARQ processes is configured by upper layers.

The HARQ process processes the New Data Indicator indicated by lower layers for each received MAC-hs PDU.

The UE shall:

- if the New Data Indicator has been incremented compared to the value in the previous received transmission in this HARQ process or this is the first received transmission in the HARQ process:
  - replace the data currently in the soft buffer for this HARQ process with the received data.
  - if the Transport Block Size index value is equal to 111111:
    - generate a positive acknowledgement (ACK) of the data in this HARQ process;
    - discard the received data;

- assume that the data has been successfully decoded;

NOTE: alternative solutions for the use of the New Data Indicator are FFS.

- if the New Data Indicator is identical to the value used in the previous received transmission in the HARQ process:
  - if the Transport Block Size index value is equal to 111111:
    - assume that the transport block size is identical to the last valid transport block size signalled for this HARQ process
  - if the data has not yet been successfully decoded:
    - combine the received data with the data currently in the soft buffer for this HARQ process
- if the data in the soft buffer has been successfully decoded and no error was detected:
  - deliver the decoded MAC-hs PDU to the reordering entity;
  - generate a positive acknowledgement (ACK) of the data in this HARQ process.
- else:
  - generate a negative acknowledgement (NAK) of the data in this HARQ process;
- schedule the generated positive or negative acknowledgement for transmission and the time of transmission relative to the reception of data in a HARQ process is configured by upper layer.

The HARQ process processes the Queue ID in the received MAC-hs PDUs. The UE shall:

- arrange the received MAC-hs PDUs in queues based on the Queue ID.