TSG-RAN Meeting #23 **RP-040104**
Phoenix, 10-12 March 2004

Title: **CRs on 25.321 Rel-5 (and linked CRs from later releases)**

Source: **TSG-RAN WG2**

Agenda item: **7.3.5**

Spec	CR	Rev	Phase	Subject	Cat	Version-Current	Version-New	Doc-2nd-Level	Workitem
25.321	185	1	Rel-5	UE handling of NDI and TBS for HSDPA	F	5.7.0	5.8.0	R2-040324	HSDPA_L23
25.321	186	1	Rel-6	UE handling of NDI and TBS for HSDPA	A	6.0.0	6.1.0	R2-040325	HSDPA_L23
25.321	187	-	Rel-5	HSDPA related corrections on MAC-hs reconfiguration	F	5.7.0	5.8.0	R2-040658	HSDPA_L23
25.321	188	-	Rel-6	HSDPA related corrections on MAC-hs reconfiguration	A	6.0.0	6.1.0	R2-040659	HSDPA_L23
25.321	189	-	Rel-5	Reconfiguration of soft memory buffer partitioning	F	5.7.0	5.8.0	R2-040660	HSDPA_L23
25.321	190	-	Rel-6	Reconfiguration of soft memory buffer partitioning	A	6.0.0	6.1.0	R2-040661	HSDPA_L23

3GPP TSG-RAN2 Meeting #40
Sophia Antipolis, France, 12th January 2004

Tdoc ⌘R2-040324

CR-Form-v7

CHANGE REQUEST

⌘ **25.321** **CR** 185 ⌘ **rev** **1** ⌘ Current version: 5.7.0 ⌘

*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:	⌘	UE handling of NDI and TBS for HSDPA
Source:	⌘	RAN WG2
Work item code:	⌘	HSDPA-L23
Date:	⌘	13/01/2004
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:	⌘	Presently, the mobile is only required to either replace the buffer with new received data or combine new received data with data already in the buffer based on the reception of NDI. However, it is also possible to detect these conditions if the TBS is also found to be different. This possibility is not required for HARQ in Rel5.
Summary of change:	⌘	The mobile is optionally allowed to replace the data currently in the soft buffer for this HARQ process with the received date when NDI is identical to the value used in the previous received transmission in the HARQ process and the transport block size is different from the last valid transport block size signalled for the HARQ process.
Consequences if not approved:	⌘	The UE can either corrupt its own HARQ buffer or miss packets.

Clauses affected:	⌘				
Other specs affected:	⌘	Y	N		
			N	Other core specifications	⌘
				Test specifications	
				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.

11.6.2.2 HARQ process

A number of parallel HARQ processes are 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 (FDD only):
    - generate a positive acknowledgement (ACK) of the data in this HARQ process;
    - discard the received data;
    - assume that the data has been successfully decoded.
- 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 (FDD only):
    - 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 transport block size is different from the last valid transport block size signalled for this HARQ process:
    - the UE may replace the data currently in the soft buffer for this HARQ process with the received data.
- 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.

3GPP TSG-RAN2 Meeting #40
Sophia Antipolis, France, 12th January 2004

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CHANGE REQUEST

⌘ **25.321** **CR** 186 ⌘ **rev** **1** ⌘ Current version: 6.0.0 ⌘

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

Title:	⌘	UE handling of NDI and TBS for HSDPA
Source:	⌘	RAN WG2
Work item code:	⌘	HSDPA-L23
Date:	⌘	13/01/2004
Category:	⌘	**A**
Release:	⌘	Rel-6

Use one of the following categories:
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R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*

Reason for change:	⌘	Presently, the mobile is only required to either replace the buffer with new received data or combine new received data with data already in the buffer based on the reception of NDI. However, it is also possible to detect these conditions if the TBS is also found to be different. This possibility is not required for HARQ in Rel5.
Summary of change:	⌘	The mobile is optionally allowed to replace the data currently in the soft buffer for this HARQ process with the received date when NDI is identical to the value used in the previous received transmission in the HARQ process and the transport block size is different from the last valid transport block size signalled for the HARQ process.
Consequences if not approved:	⌘	The UE can either corrupt its own HARQ buffer or miss packets.

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

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A number of parallel HARQ processes are 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 (FDD only):
    - generate a positive acknowledgement (ACK) of the data in this HARQ process;
    - discard the received data;
    - assume that the data has been successfully decoded.
- 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 (FDD only):
    - 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 transport block size is different from the last valid transport block size signalled for this HARQ process:
    - the UE may replace the data currently in the soft buffer for this HARQ process with the received data.
- 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.

3GPP TSG RAN2 Meeting #41
Malaga, Spain, 16 - 20 February, 2004

Tdoc ⌘R2-040658

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CHANGE REQUEST

⌘ **25.321** **CR** **187** ⌘**rev** ⌘ Current version: **5.7.0** ⌘

*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 related corrections on MAC-hs reconfiguration
Source:	⌘	RAN WG2
Work item code:	⌘	HSDPA-L23
Date:	⌘	February 12, 2004
Category:	⌘	**F**
Release:	⌘	Rel-5

Use one of the following categories:
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B *(addition of feature),*
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D *(editorial modification)*
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R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*

Reason for change:	⌘[H	When the MAC-hs parameters timer T1 and MAC-d PDU size index of an individual MAC-hs queue is modified UE actions are not clear~~.~~. There could be a T1 timer running for this queue at the activation time of the reconfiguration message. How the UE should deal with the PDUs in the re-ordering buffer at the activation time if the old T1 timer is still running is not clear.
Summary of change:	⌘	It is stated that at the acitivation time for the change in MAC-d PDU size index, the UE shall deliver all MAC-d PDUs upto and including TSN=T1_TSN and then upto to the next not received MAC-hs PDU, to the disassembly entity. For a change in T1 the UE starts to use the new value of T1 the next time T1 is started.
Consequences if not approved:	⌘	UE actions in case of network changing MAC_hs parameters timer T1 and MAC-d PDU size index will not be stated in the specifications leading to different implementations and uncertainity in the scheduler implementation at the Node B.

Clauses affected:	⌘	11.6.2.6

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:

Parameters

- Transmitter window size (TRANSMIT_WINDOW_SIZE)
  TRANSMIT_WINDOW_SIZE is the size of the transmitter window according to the definition below. This is a parameter in the Node B and the value of the parameter is configured by higher layers.

- Receiver window size (RECEIVE_WINDOW_SIZE)
  RECEIVE_WINDOW_SIZE is the size of the receiver window according to the definition below. This is a parameter in the UE and the value of the parameter is configured by higher layers.

State variables

- 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 delivery to the disassembly entity of the MAC-hs PDU with TSN equal to next_expected_TSN. The initial value of next_expected_TSN =0.

- RcvWindow_UpperEdge:
  The RcvWindow_UpperEdge represents the TSN, which is at the upper edge of the receiver window. After the first MAC-hs PDU has been received successfully, it also corresponds to the MAC-hs PDU with the highest TSN of all received MAC-hs PDUs. The initial RcvWindow_UpperEdge equals 63. RcvWindow_UpperEdge is updated based on the reception of new MAC-hs PDU according to the procedure given below.

- T1_TSN:
  The TSN of the latest MAC-hs PDU that cannot be delivered to the disassembly entity, when the timer T1 is started.

Timers

- Re-ordering release timer (T1):
  The Re-ordering release timer T1 controls the stall avoidance in the UE reordering buffer as described below. The value of T1 is configured by upper layers.

Other definitions

- Receiver window:
  The receiver window defines TSNs of those 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 RECEIVE_WINDOW_SIZE and spans TSNs going from RcvWindow_UpperEdge – RECEIVE_WINDOW_SIZE + 1 to RcvWindow_UpperEdge included.

11.6.2.3.2 Reordering functionality

If no timer T1 is active:

- the timer T1 shall be started when a MAC-hs PDU with TSN > next_expected_TSN is correctly received.

- T1_TSN shall be set to the TSN of this MAC-hs PDU.

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 with TSN = T1_TSN can be delivered to the disassembly entity before the timer expires.

When the timer T1expires and T1_TSN > next_expected_TSN:

- all correctly received MAC-hs PDUs with TSN > next_expected_TSN up to and including T1_TSN-1 shall be delivered to the disassembly entity;
- all correctly received MAC-hs PDUs up to the next not received MAC-hs PDU shall be delivered to the disassembly entity.
- next_expected_TSN shall be set to the TSN of the next not received MAC-hs PDU.

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
- set T1_TSN to the highest TSN among those of the 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 – TRANSMIT_WINDOW_SIZE should not be retransmitted to avoid sequence number ambiguity in the receiver.

Receiver operation:

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

- if SN is within the receiver window:
  - if SN < next_expected_TSN, or this MAC-hs PDU has previously been received:
    - the MAC-hs PDU shall be discarded;
  - else:
    - the MAC-hs PDU shall be placed in the reordering buffer at the place indicated by the TSN.
- 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;
  - RcvWindow_UpperEdge shall be set to SN thus advancing the receiver window;
  - any MAC-hs PDUs with TSN ≤ RcvWindow_UpperEdge – RECEIVE_WINDOW_SIZE, 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;
  - if next_expected_TSN is below the updated receiver window:
    - next_expected_TSN shall be set to RcvWindow_UpperEdge – RECEIVE_WINDOW_SIZE + 1;
- if the MAC-hs PDU with TSN = next_expected_TSN is stored in the reordering buffer:
  - all received MAC-hs PDUs with consecutive TSNs from next_expected_TSN (included) up to the first not received MAC-hs PDU shall be delivered to the disassembly entity;
  - next_expected_TSN shall be advanced to the TSN of this first not received MAC-hs PDU.

In case a UE has insufficient memory to process a received MAC-hs PDU, it shall perform the following set of operations:

- select TSN_flush such that: next_expected_TSN < TSN_flush ≤ RcvWindow_UpperEdge + 1;
- deliver all correctly received MAC-hs PDUs with TSN < TSN_flush to the disassembly entity;
- if the MAC-hs PDU with TSN=TSN_flush has previously been received:
  - deliver all received MAC-hs PDUs with consecutive TSNs from TSN_flush (included) up to the first not received MAC-hs PDU to the disassembly entity;
  - advance next_expected_TSN to the TSN of this first not received MAC-hs PDU.
- else:
  - set next_expected_TSN to TSN_flush.

11.6.2.4 Disassembly entity

For each MAC-hs PDU that is delivered to the disassembly entity, the UE shall:

- remove any padding bits if present;
- remove the MAC-hs header;
- deliver the MAC-d PDUs in the MAC-hs PDU to MAC-d.

11.6.2.5 MAC-hs Reset

If a reset of the MAC-hs entity is requested by upper layers, the UE shall:

- flush soft buffer for all configured HARQ processes;
- stop all active re-ordering release timer (T1) and set all timer T1 to their initial value;
- start TSN with value 0 for the next transmission on every configured HARQ process;
- initialise the variables RcvWindow_UpperEdge and next_expected_TSN to their initial values;
- disassemble all MAC-hs PDUs in the re-ordering buffer and deliver all MAC-d PDUs to the MAC-d entity;
- flush the re-ordering buffer.

and then:

- indicate to all AM RLC entities mapped on HS-DSCH to generate a status report.

11.6.2.6 Reconfiguration of MAC-hs parameters

The parameters for a MAC-hs entity may be reconfigured (modifed) by upper layers.

When a parameter is reconfigured by the upper layer, the UE shall:

- start using the reconfigured value of the parameter at the activation time indicated by higher layers.

If the parameter T1 is reconfigured for an already existing re-ordering queue, the UE shall:

- start to use the new value of T1 the next time T1 is started.

~~for this re-ordering queue, at the activation time indicaed by higher layers, if T1is running:~~

- ~~stop T1~~
- ~~deliver all correctly received MAC-hs PDUs with TSN < next_expected_TSN up to and including T1_TSN to the disassembly entity;~~

~~— deliver all correctly received MAC-hs PDUs up to the next not received MAC-hs PDU to the disassembly entity;~~

~~— set next_expected_TSN to the TSN of the next not received MAC-hs PDU;~~

~~— if there still exist some received MAC-hs PDUs that can not be delivered to higher layer:~~

~~— start timer T1 using the new value~~

~~— set T1_TSN to the highest TSN among those of the MAC-hs PDUs that can not be delivered~~

If the MAC-d PDU size info (i.e. mapping of MAC-d PDU size index to MAC-d PDU size) is reconfigured for an already existing re-ordering queue, at the activation time indicated by higher layers, the UE shall:

- stop timer T1 if running;
- set next expected TSN to (highest TSN of received MAC-hs PDU of this re-ordering queue + 1);
- deliver all correctly received MAC-hs PDUs in this re-ordering queue to the disassembly entity and use the old MAC-d PDU size info for these MAC-hs PDUs.

If the parameter RECEIVE_WINDOW_SIZE is reconfigured for a re-ordering queue, the UE shall:

- set RECEIVE_WINDOW_SIZE to the new value;
- remove any MAC-hs PDUs in this re-ordering queue with TSN ≤ RcvWindow_UpperEdge – RECEIVE_WINDOW_SIZE (i.e. outside the receiver window after its size is updated) from the reordering buffer and deliver these MAC-hs PDUs to the disassembly entity;
- if next_expected_TSN ≤ RcvWindow_UpperEdge – RECEIVE_WINDOW_SIZE:
  - set next_expected_TSN to RcvWindow_UpperEdge – RECEIVE_WINDOW_SIZE + 1;
  - deliver all received MAC-hs ~~PDUs~~ PDUs in this re-ordering queue with consecutive TSNs from next_expected_TSN (included) up to the first not received MAC-hs PDU to the disassembly entity;
  - advance next_expected_TSN to the TSN of this first not received MAC-hs PDU.

3GPP TSG RAN2 Meeting #41
Malaga, Spain, 16 - 20 February, 2004

Tdoc ⌘R2-040659

CR-Form-v7

CHANGE REQUEST

⌘ **25.321** **CR** **188** ⌘**rev** ⌘ Current version: **6.0.0** ⌘

*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:	⌘	HSDPA related corrections on MAC-hs reconfiguration
Source:	⌘	RAN WG2
Work item code:	⌘	HSDPA-L23
Date:	⌘	February 12, 2004
Category:	⌘	**A**
Release:	⌘	Rel-6

Use one of the following categories:
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Reason for change:	⌘[H	When the MAC-hs parameters timer T1 and MAC-d PDU size index of an individual MAC-hs queue is modified UE actions are not clear~~.~~. There could be a T1 timer running for this queue at the activation time of the reconfiguration message. How the UE should deal with the PDUs in the re-ordering buffer at the activation time if the old T1 timer is still running is not clear.
Summary of change:	⌘	It is stated that at the acitivation time for the change in MAC-d PDU size index, the UE shall deliver all MAC-d PDUs upto and including TSN=T1_TSN and then upto to the next not received MAC-hs PDU, to the disassembly entity. For a change in T1 the UE starts to use the new value of T1 the next time T1 is started.
Consequences if not approved:	⌘	UE actions in case of network changing MAC_hs parameters timer T1 and MAC-d PDU size index will not be stated in the specifications leading to different implementations and uncertainity in the scheduler implementation at the Node B.

Clauses affected:	⌘	11.6.2.6			
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:

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- Receiver window size (RECEIVE_WINDOW_SIZE)
  RECEIVE_WINDOW_SIZE is the size of the receiver window according to the definition below. This is a parameter in the UE and the value of the parameter is configured by higher layers.

State variables

- 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 delivery to the disassembly entity of the MAC-hs PDU with TSN equal to next_expected_TSN. The initial value of next_expected_TSN =0.

- RcvWindow_UpperEdge:
  The RcvWindow_UpperEdge represents the TSN, which is at the upper edge of the receiver window. After the first MAC-hs PDU has been received successfully, it also corresponds to the MAC-hs PDU with the highest TSN of all received MAC-hs PDUs. The initial RcvWindow_UpperEdge equals 63. RcvWindow_UpperEdge is updated based on the reception of new MAC-hs PDU according to the procedure given below.

- T1_TSN:
  The TSN of the latest MAC-hs PDU that cannot be delivered to the disassembly entity, when the timer T1 is started.

Timers

- Re-ordering release timer (T1):
  The Re-ordering release timer T1 controls the stall avoidance in the UE reordering buffer as described below. The value of T1 is configured by upper layers.

Other definitions

- Receiver window:
  The receiver window defines TSNs of those 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 RECEIVE_WINDOW_SIZE and spans TSNs going from RcvWindow_UpperEdge – RECEIVE_WINDOW_SIZE + 1 to RcvWindow_UpperEdge included.

11.6.2.3.2 Reordering functionality

If no timer T1 is active:

- the timer T1 shall be started when a MAC-hs PDU with TSN > next_expected_TSN is correctly received.

- T1_TSN shall be set to the TSN of this MAC-hs PDU.

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 with TSN = T1_TSN can be delivered to the disassembly entity before the timer expires.

When the timer T1expires and T1_TSN > next_expected_TSN:

- all correctly received MAC-hs PDUs with TSN > next_expected_TSN up to and including T1_TSN-1 shall be delivered to the disassembly entity;
- all correctly received MAC-hs PDUs up to the next not received MAC-hs PDU shall be delivered to the disassembly entity.
- next_expected_TSN shall be set to the TSN of the next not received MAC-hs PDU.

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
- set T1_TSN to the highest TSN among those of the 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 – TRANSMIT_WINDOW_SIZE should not be retransmitted to avoid sequence number ambiguity in the receiver.

Receiver operation:

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

- if SN is within the receiver window:
  - if SN < next_expected_TSN, or this MAC-hs PDU has previously been received:
    - the MAC-hs PDU shall be discarded;
  - else:
    - the MAC-hs PDU shall be placed in the reordering buffer at the place indicated by the TSN.
- 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;
  - RcvWindow_UpperEdge shall be set to SN thus advancing the receiver window;
  - any MAC-hs PDUs with TSN ≤ RcvWindow_UpperEdge – RECEIVE_WINDOW_SIZE, 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;
  - if next_expected_TSN is below the updated receiver window:
    - next_expected_TSN shall be set to RcvWindow_UpperEdge – RECEIVE_WINDOW_SIZE + 1;
- if the MAC-hs PDU with TSN = next_expected_TSN is stored in the reordering buffer:
  - all received MAC-hs PDUs with consecutive TSNs from next_expected_TSN (included) up to the first not received MAC-hs PDU shall be delivered to the disassembly entity;
  - next_expected_TSN shall be advanced to the TSN of this first not received MAC-hs PDU.

In case a UE has insufficient memory to process a received MAC-hs PDU, it shall perform the following set of operations:

- select TSN_flush such that: next_expected_TSN < TSN_flush ≤ RcvWindow_UpperEdge + 1;
- deliver all correctly received MAC-hs PDUs with TSN < TSN_flush to the disassembly entity;
- if the MAC-hs PDU with TSN=TSN_flush has previously been received:
  - deliver all received MAC-hs PDUs with consecutive TSNs from TSN_flush (included) up to the first not received MAC-hs PDU to the disassembly entity;
  - advance next_expected_TSN to the TSN of this first not received MAC-hs PDU.
- else:
  - set next_expected_TSN to TSN_flush.

11.6.2.4 Disassembly entity

For each MAC-hs PDU that is delivered to the disassembly entity, the UE shall:

- remove any padding bits if present;
- remove the MAC-hs header;
- deliver the MAC-d PDUs in the MAC-hs PDU to MAC-d.

11.6.2.5 MAC-hs Reset

If a reset of the MAC-hs entity is requested by upper layers, the UE shall:

- flush soft buffer for all configured HARQ processes;
- stop all active re-ordering release timer (T1) and set all timer T1 to their initial value;
- start TSN with value 0 for the next transmission on every configured HARQ process;
- initialise the variables RcvWindow_UpperEdge and next_expected_TSN to their initial values;
- disassemble all MAC-hs PDUs in the re-ordering buffer and deliver all MAC-d PDUs to the MAC-d entity;
- flush the re-ordering buffer.

and then:

- indicate to all AM RLC entities mapped on HS-DSCH to generate a status report.

11.6.2.6 Reconfiguration of MAC-hs parameters

The parameters for a MAC-hs entity may be reconfigured (modifed) by upper layers.

When a parameter is reconfigured by the upper layer, the UE shall:

- start using the reconfigured value of the parameter at the activation time indicated by higher layers.

If the parameter T1 is reconfigured for an already existing re-ordering queue, the UE shall:

- start to use the new value of T1 the next time T1 is started.

~~for this re-ordering queue, at the activation time indicaed by higher layers, if T1is running:~~

- ~~stop T1~~
- ~~deliver all correctly received MAC-hs PDUs with TSN < next_expected_TSN up to and including T1_TSN to the disassembly entity;~~

~~- deliver all correctly received MAC-hs PDUs up to the next not received MAC-hs PDU to the disassembly entity;~~

~~- set next_expected_TSN to the TSN of the next not received MAC-hs PDU;~~

~~- if there still exist some received MAC-hs PDUs that can not be delivered to higher layer:~~

~~- start timer T1 using the new value~~

~~- set T1_TSN to the highest TSN among those of the MAC-hs PDUs that can not be delivered~~

If the MAC-d PDU size info (i.e. mapping of MAC-d PDU size index to MAC-d PDU size) is reconfigured for an already existing re-ordering queue, at the activation time indicated by higher layers, the UE shall:

- stop timer T1 if running;
- set next expected TSN to (highest TSN of received MAC-hs PDU of this re-ordering queue + 1);
- deliver all correctly received MAC-hs PDUs in this re-ordering queue to the disassembly entity and use the old MAC-d PDU size info for these MAC-hs PDUs.

If the parameter RECEIVE_WINDOW_SIZE is reconfigured for a re-ordering queue, the UE shall:

- set RECEIVE_WINDOW_SIZE to the new value;
- remove any MAC-hs PDUs in this re-ordering queue with TSN ≤ RcvWindow_UpperEdge – RECEIVE_WINDOW_SIZE (i.e. outside the receiver window after its size is updated) from the reordering buffer and deliver these MAC-hs PDUs to the disassembly entity;
- if next_expected_TSN ≤ RcvWindow_UpperEdge – RECEIVE_WINDOW_SIZE:
  - set next_expected_TSN to RcvWindow_UpperEdge – RECEIVE_WINDOW_SIZE + 1;
  - deliver all received MAC-hs ~~PDUs~~ PDUs in this re-ordering queue with consecutive TSNs from next_expected_TSN (included) up to the first not received MAC-hs PDU to the disassembly entity;
  - advance next_expected_TSN to the TSN of this first not received MAC-hs PDU.

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Malaga, Spain, 16-20 February 2004

Tdoc ⌘ R2-040660

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CHANGE REQUEST

⌘ **25.321** **CR** **189** ⌘ **rev** **-** ⌘ Current version: **5.7.0** ⌘

*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:	⌘	Reconfiguration of soft memory buffer partitioning
Source:	⌘	RAN WG2
Work item code:	⌘	HSDPA_L23
Date:	⌘	20/Feb/2004
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: ⌘

It is not currently specified how UE should handle data in the soft buffer in the case that soft memory buffer partitioning is reconfigured.

From Node-B implementation point of view it should be known how UE handles data in this reconfiguration case so that Node-B can decide which retransmission scheme it's going to use (i.e. identical retransmission or non-identical retransmission).

Mandating UE to re-organise stored soft-bit data into the reconfigured partition seems to put too much requirement on UE implementation. Especially how UE handles overflowed data and even how UE determines overflowed and possibly discarded data are quite difficult to define.

It is proposed to specify UE may flush its soft buffer when a reconfiguration of soft memory buffer partitioning occurs.

Summary of change: ⌘

In section 11.6.2.6 it is stated that UE may flush the soft buffer if a reconfiguration of soft buffer partitioning occurs.

Change from previous revision

Applied requirement has been changed from "may" to "shall".

Consequences if not approved: ⌘

UE behaviour upon a reconfiguration of soft buffer partitioning is unclear in the specification, which could lead to an unexpected UE behaviour if UE implementation doesn't take into account a possible overflow scenario.

Node-B would not know which retransmission scheme it should use.

Isolated impact analysis:
The CR has isolated impact on a reconfiguration of soft memory buffer

	partitioning. **Impact on test specifications:** No impact.

Clauses affected:	⌘	11.6.2.6			
		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:
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.

11.6.2.6 Reconfiguration of MAC-hs parameters

The parameters for a MAC-hs entity may be reconfigured (modifed) by upper layers.

When a parameter is reconfigured by the upper layer, the UE shall:

- start using the reconfigured value of the parameter.

If the parameter RECEIVE_WINDOW_SIZE is reconfigured, the UE shall:

- set RECEIVE_WINDOW_SIZE to the new value;
- remove any MAC-hs PDUs with TSN ≤ RcvWindow_UpperEdge – RECEIVE_WINDOW_SIZE (i.e. outside the receiver window after its size is updated) from the reordering buffer and deliver these MAC-hs PDUs to the disassembly entity;
- if next_expected_TSN ≤ RcvWindow_UpperEdge – RECEIVE_WINDOW_SIZE:
  - set next_expected_TSN to RcvWindow_UpperEdge – RECEIVE_WINDOW_SIZE + 1;
  - deliver all received MAC-hs PDUs with consecutive TSNs from next_expected_TSN (included) up to the first not received MAC-hs PDU to the disassembly entity;
  - advance next_expected_TSN to the TSN of this first not received MAC-hs PDU.

If the "Memory Partitioning" (see [7]) for soft buffer is reconfigured, the UE shall:

- flush soft buffer for all configured HARQ processes;

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CHANGE REQUEST

⌘ **25.321** **CR** **190** ⌘ **rev** **-** ⌘ Current version: **6.0.0** ⌘

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- if next_expected_TSN ≤ RcvWindow_UpperEdge – RECEIVE_WINDOW_SIZE:
  - set next_expected_TSN to RcvWindow_UpperEdge – RECEIVE_WINDOW_SIZE + 1;
  - deliver all received MAC-hs PDUs with consecutive TSNs from next_expected_TSN (included) up to the first not received MAC-hs PDU to the disassembly entity;
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