TSG-RAN Meeting #20 ***RP-030297***
Hämeenlinna, Finland, 03-06 June 2003

Title: **CRs (Rel-4 and Rel-5 category A) to TS 25.322**

Source: **TSG-RAN WG2**

Agenda item: **7.2.4**

Spec	CR	Rev	Phase	Subject	Cat	Version-Current	Version-New	Doc-2nd-Level	Workitem
25.322	221	-	Rel-4	Receiver behaviour when detecting an AMD PDU duplicate	F	4.8.0	4.9.0	R2-031355	TEI4
25.322	222	-	Rel-5	Receiver behaviour when detecting an AMD PDU duplicate	A	5.4.0	5.5.0	R2-031356	TEI4
25.322	226	-	Rel-4	RLC window size reconfigurations	F	4.8.0	4.9.0	R2-031469	TEI4
25.322	227	-	Rel-5	RLC window size reconfigurations	A	5.4.0	5.5.0	R2-031470	TEI4

3GPP TSG-RAN-WG2 Meeting #35 **R2-031355**
Paris, France, 19th – 23rd May, 2003

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CHANGE REQUEST

⌘ **25.322** **CR** **221** ⌘ **rev** **-** ⌘ Current version: **4.8.0** ⌘

*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:	⌘	Receiver behaviour when detecting an AMD PDU duplicate
Source:	⌘	RAN WG2
Work item code:	⌘	TEI4
Date:	⌘	10/04/2003
Category:	⌘	**F**
Release:	⌘	Rel-4

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:	⌘	Duplicate detection is one function of AM RLC according to section 5. However, no details are given in the section 11.3 on “Acknowledged mode data transfer procedure” , how the receiver behaves in case it detects a duplicate.
Summary of change:	⌘	A section is added, which gives details on how the AM RLC Receiver behaves, if it receives a AMD PDU duplicate
Consequences if not approved:	⌘	Incomplete specification

Clauses affected:	⌘	11.3.4.8 (NEW)

		Y	N		
Other specs affected:	⌘		X	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.

[…]

11.3.3 Reception of AMD PDU by the Receiver

Upon reception of an AMD PDU, the Receiver shall:

- update VR(R), VR(H) and VR(MR) state variables for each received AMD PDU (see clause 9.4);
- if a received AMD PDU includes a "Polling bit" set to "1", or "Missing PDU Indicator" is configured and the Receiver detects that a PDU is missing:
  - initiate the STATUS PDU transfer procedure;
- reassemble the received AMD PDUs into RLC SDUs;
- if "In-Sequence Delivery" is configured:
  - deliver the RLC SDUs in-sequence (i.e. in the same order as the RLC SDUs were originally transmitted by the peer entity) to upper layers through the AM-SAP.
- otherwise:
  - deliver the RLC SDUs in arbitrary order to upper layers through the AM-SAP.

11.3.3a Reached maximum number of attempts

If VT(DAT) = MaxDAT, the Sender shall:

- if "No_discard after MaxDAT number of transmissions" is configured:
  - initiate the RLC reset procedure, see subclause 11.4.
- if "SDU discard after MaxDAT number of transmissions" is configured:
  - initiate the "SDU discard with explicit signalling" procedure for the corresponding SDU, see subclause 11.6.

11.3.4 Abnormal cases

11.3.4.1 Void

11.3.4.2 Receiving an AMD PDU outside the reception window

Upon reception of an AMD PDU with "Sequence Number" outside the interval VR(R)≤SN<VR(MR), the Receiver shall:

- discard the AMD PDU;
- if the "polling bit" in the discarded AMD PDU is set to "1":
  - initiate the STATUS PDU transfer procedure.

11.3.4.3 Timer_Discard timeout

11.3.4.3.1 SDU discard with explicit signalling

Upon expiry of the timer Timer_Discard, the Sender shall:

- initiate the SDU discard with explicit signalling procedure, see subclause 11.6.2.

In the case where the TFC selection exchange has been initiated by sending the RLC Entity Info parameter to MAC, the UE may wait until after it provides MAC with the requested set of PDUs before discarding the afore-mentioned SDUs.

11.3.4.4 Void

11.3.4.5 Invalid length indicator value

If the "Length Indicator" of an AMD PDU has a value that is larger than the PDU size – RLC header size and is not one of the predefined values listed in the table of subclause 9.2.2.8, the Receiver shall:

- ignore that AMD PDU.

11.3.4.6 Length Indicator value reserved for AMD PDU

Upon delivery by the lower layer of an AMD PDU that contains a "Length Indicator" value specified to be reserved for AMD PDUs in this version of the protocol, the Receiver shall:

- ignore that AMD PDU.

11.3.4.7 Void

11.3.4.8 Receiving an AMD PDU within the reception window more than once (Handling of Duplicates)

Upon reception of an AMD PDU with a “Sequence Number” within the interval VR(R)≤SN<VR(MR), for which “Sequence Number” an AMD PDU has already been received, the Receiver shall:

- discard the AMD PDU;
- consider the AMD PDU with this “Sequence Number” as having been correctly received in the next status report to be transmitted.
- if the "polling bit" in the discarded AMD PDU is set to "1":
  - initiate the STATUS PDU transfer procedure;

11.4 RLC reset procedure

[…]

3GPP TSG-RAN-WG2 Meeting #36 **R2-031356**
Paris, France, 19th – 23rd May, 2003

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CHANGE REQUEST

⌘ **25.322** **CR** **222** ⌘ **rev** **-** ⌘ Current version: **5.4.0** ⌘

*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:	⌘	Receiver behaviour when detecting an AMD PDU duplicate
Source:	⌘	RAN WG2
Work item code:	⌘	TEI4
Date:	⌘	10/04/2003
Category:	⌘	**A**
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)*
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R99	*(Release 1999)*
Rel-4	*(Release 4)*
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Reason for change:	⌘	Duplicate detection is one function of AM RLC according to section 5. However, no details are given in the section 11.3 on "Acknowledged mode data transfer procedure", how the receiver behaves in case it detects a duplicate.
Summary of change:	⌘	A section is added, which gives details on how the AM RLC Receiver behaves, if it receives a AMD PDU duplicate
Consequences if not approved:	⌘	Incomplete specification

Clauses affected:	⌘	11.3.4.8 (NEW)			
Other specs affected:	⌘	**Y**	**N**		⌘
			X	Other core specifications	
				Test specifications	
				O&M Specifications	
Other comments:	⌘				

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- if "In-Sequence Delivery" is configured:
  - deliver the RLC SDUs in-sequence (i.e. in the same order as the RLC SDUs were originally transmitted by the peer entity) to upper layers through the AM-SAP.
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11.3.4 Abnormal cases

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Upon reception of an AMD PDU with "Sequence Number" outside the interval VR(R)≤SN<VR(MR), the Receiver shall:

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- if the "polling bit" in the discarded AMD PDU is set to "1":
  - initiate the STATUS PDU transfer procedure.

11.3.4.3 Timer_Discard timeout

11.3.4.3.1 SDU discard with explicit signalling

Upon expiry of the timer Timer_Discard, the Sender shall:

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In the case where the TFC selection exchange has been initiated by sending the RLC Entity Info parameter to MAC, the UE may wait until after it provides MAC with the requested set of PDUs before discarding the afore-mentioned SDUs.

11.3.4.4 Void

11.3.4.5 Invalid length indicator value

If the "Length Indicator" of an AMD PDU has a value that is larger than the PDU size – RLC header size and is not one of the predefined values listed in the table of subclause 9.2.2.8, the Receiver shall:

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Upon delivery by the lower layer of an AMD PDU that contains a "Length Indicator" value specified to be reserved for AMD PDUs in this version of the protocol, the Receiver shall:

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11.3.4.7 Void

11.3.4.8 Receiving an AMD PDU within the reception window more than once (Handling of Duplicates)

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- if the "polling bit" in the discarded AMD PDU is set to "1":
  - initiate the STATUS PDU transfer procedure;

[…]

3GPP TSG-RAN2 Meeting #36
Paris, France 19th to 23rd May 2003

Tdoc ⌘R2-031469

CR-Form-v7

CHANGE REQUEST

⌘ **25.322** **CR** **226** ⌘ **rev** **-** ⌘ Current version: **4.8.0** ⌘

*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: ⌘	RLC window size reconfigurations	
Source: ⌘	RAN WG2	
Work item code: ⌘	TEI4	***Date:*** ⌘ March 2003
Category: ⌘	**F**	***Release:*** ⌘ Rel-4

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.

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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: ⌘

RRC signalling currently support reconfiguration of RLC parameters during a connection, e.g. with a RADIO BEARER RECONFIGURATION message. However, as discussed at RAN2#32 in relation to document R2-022651 the actions related to a reconfiguration (particularly a reduction) of the RLC window size are not explicitly specified in 25.322.

As a result, the UTRAN will always have to consider possible future RABs to be established during this connection, and reserve memory for these possible future RABs), when it is establishing the first RAB.

Especially for higher rate RAB's, not using all available memory will limit throughput unnecessarily.

Tdoc's R2-022651 and R2-031023 provide detailed information on this issue.

Summary of change: ⌘

A new section is proposed which describes the UE behaviour in case of RLC parameter reconfiguration by higher layers.

In this section it is clearly indicated, that reconfigurations may never lead to data loss on AM RB's.

Isolated Impact Change Analysis.
The behaviour for UE's not complying to this CR is not specified in detail today. If it is assumed that such a UE will reject a concerning RRC request, then a UTRAN will be made aware of the UE limitation. As a result, the UTRAN might not be able to add additional RAB's.

Consequences if not approved:	⌘	If this CR is not accepted, the indicated suboptimal memory usage and unnecessary throughput limitation will remain.

Clauses affected:	⌘	9.7.x			
Other specs affected:	⌘	**Y** / **N**	Other core specifications	⌘	
			X	Test specifications	
			X	O&M Specifications	
			X		
Other comments:	⌘				

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9.7.x Reconfiguration of RLC parameters by upper layers

The RLC parameters for an RLC entity may be reconfigured (modifed) by upper layers.

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

- start using the reconfigured value of the RLC parameter.

If the parameter Configured_Rx_Window_Size is reconfigured:

- the UE shall update the state variable VR(MR), (see clause 9.4);
- for AMD PDUs with “Sequence Number” x such that VR(MR)<=x<VR(H):
  - the UE may discard these AMD PDUs.

If the parameter Configured_Tx_Window_Size is reconfigured:

- the UE shall set the state variable VT(WS) equal to the Configured_Tx_Window_Size;
- the UE shall update the state variable VT(MS), (see clause 9.4);
- for AMD PDUs with “Sequence Number” x such that VT(MS)<=x<VT(S):
  - the UE shall not discard any AMD PDUs that are not positively acknowledged;
  - the UE may discard AMD PDUs that are positively acknowledged.

3GPP TSG-RAN2 Meeting #36
Paris, France 19th to 23rd May 2003

Tdoc ⌘R2-031470

CR-Form-v7

CHANGE REQUEST

⌘ **25.322** **CR** **227** ⌘ **rev** **-** ⌘ Current version: **5.4.0** ⌘

*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: ⌘	RLC window size reconfigurations	
Source: ⌘	RAN WG2	
Work item code: ⌘	TEI4	***Date:*** ⌘ March 2003
Category: ⌘	**A**	***Release:*** ⌘ Rel-5

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Summary of change: ⌘

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In this section it is clearly indicated, that reconfigurations may never lead to data loss on AM RB's.

Isolated Impact Change Analysis.
The behaviour for UE's not complying to this CR is not specified in detail today. If it is assumed that such a UE will reject a concerning RRC request, then a UTRAN will be made aware of the UE limitation. As a result, the UTRAN might not be able to add additional RAB's.

Consequences if not approved:	⌘	If this CR is not accepted, the indicated suboptimal memory usage and unnecessary throughput limitation will remain.

Clauses affected:	⌘	9.7.x			
Other specs affected:	⌘	**Y** / **N**	Other core specifications	⌘	
			X	Test specifications	
			X	O&M Specifications	
			X		
Other comments:	⌘				

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- the UE shall update the state variable VT(MS), (see clause 9.4);
- for AMD PDUs with “Sequence Number” x such that VT(MS)<=x<VT(S):
  - the UE shall not discard any AMD PDUs that are not positively acknowledged;
  - the UE may discard AMD PDUs that are positively acknowledged.