TSG RAN Meeting #28 **RP-050359**
Quebec, Canada, 1 - 3 June 2005

Title	**CR (Rel6) to TS25.331 on Support for out-of-sequence PDUs in RLC-UM**
Source	**Qualcomm Europe**
Agenda Item	**8.11**

Spec	CR	Rev	Phase	Subject	Cat	Version-Current	Version-New	Doc-2nd-Level	Workitem
25.331	2579	2	Rel-6	Support for out-of-sequence PDUs in RLC-UM	B	6.5.0	6.6.0		TEI6

Note: RAN2 agreed 25.331 CR 2579 is in RP-050320. The related RAN2 agreed 25.322 CR 278 is in RP-050319.

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Tdoc ⌘ RP-050359

CR-Form-v7.1

CHANGE REQUEST

⌘ **25.331** **CR** **2579** ⌘ **rev** **2** ⌘ Current version: **6.5.0** ⌘

*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:	⌘	Support for out-of-sequence PDUs in RLC-UM
Source:	⌘	Qualcomm Europe
Work item code:	⌘	TEI6
Date:	⌘	May 2005
Category:	⌘	**B**
Release:	⌘	Rel-6

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:

Ph2	*(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)*
Rel-7	*(Release 7)*

Reason for change:	⌘	Support out-of-sequence reception and possibility to configure the relative size of the “early” and “late” part of the reception window.
Summary of change:	⌘	Introduced a configuration parameter for the reception window for RLC-UM. Indicate that the presence of this parameter should be construed as implying that the functionality is enabled. Only the UEs supporting HSDPA are required to understand and use this new configuration parameter.
Consequences if not approved:	⌘	It will be impossible to configure out-of-sequence support in RLC-UM and it will be impossible to perform seamless cell changes..

Clauses affected:	⌘	Affected clauses			
Other specs affected:	⌘	**Y** / **N**	Other core specifications	⌘	25.322 CR 278 in RP-050319
		N / **X**	Test specifications		
		N / **X**	O&M Specifications		
Other comments:	⌘	Changes with respect to the previous revision are highlighted Changes with respect to Revision 1 are highlighet in green			

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.

8.6.4.9 RLC Info

Upon reception of the IE "RLC Info", the UE shall:

1> configure the transmitting and receiving RLC entities in the UE for that radio bearer accordingly;

1> if the IE "Polling info" is present in the IE "RLC info":

2> for each present IE in the IE "Polling info":

3> configure RLC to use the corresponding function according to the value of the IE.

2> for each absent IE in the IE "Polling info":

3> configure RLC to not use the corresponding function.

1> if the IE "Polling info" is absent:

2> configure RLC to not use the polling functionality.

1> if the IE "Downlink RLC STATUS info" is present in the IE "RLC info" (this IE is present for AM RLC):

2> for each present IE in the IE "Downlink RLC STATUS info":

3> configure RLC to use the corresponding function according to value of the IE.

2> for each absent IE in the IE "Downlink RLC STATUS info":

3> configure RLC to not use the corresponding function.

1> if the IE "Transmission RLC discard" is present:

2> configure the discard procedure in RLC according to the IE "Transmission RLC discard"

1> if the IE "Transmission RLC discard" is absent (only possible for TM RLC and UM RLC):

2> do not configure SDU discard in RLC.

1> if the IE "Downlink RLC mode" is present and is set to "AM RLC":

2> if IE "DL RLC PDU size" is not present:

3> determining the downlink RLC PDU size will be handled at RLC level as described in [16], without any configuration from RRC.

NOTE: The case where this mandatory IE is not present is meant to handle the interaction with a network using an earlier release of the specification.

2> else, if the IE "DL RLC PDU size" is present and no downlink RLC PDU size is currently set in the RLC entity:

3> configure the corresponding RLC entity with the downlink RLC PDU size.

2> else, if the IE "DL RLC PDU size" is present and its value is different from the one currently set in the RLC entity:

NOTE: The downlink RLC PDU size set in the RLC entity can either be explicitly configured or, in case no explicit configuration is provided, derived by the first received RLC PDU [16].

3> if the IE "one sided RLC re-establishment" is set to TRUE:

4> re-establish the receiving side of the corresponding RLC entity.

3> else:

4> re-establish the corresponding RLC entity.

3> configure the corresponding RLC entity with the new downlink RLC PDU size;

3> if the IE "Status" in the variable CIPHERING_STATUS of the CN domain as indicated in the IE "CN domain identity" in the IE "RAB info" for this radio bearer is set to "Started":

4> if the RLC re-establishment is caused by a CELL UPDATE CONFIRM:

5> if only the receiving side of the RLC entity was re-established:

6> set the HFN values for the corresponding RLC entity in downlink equal to the value of the IE "START" included in the latest transmitted CELL UPDATE message for this CN domain.

5> if the whole RLC entity was re-established:

6> set the HFN values for the corresponding RLC entity in uplink and downlink equal to the value of the IE "START" included in the latest transmitted CELL UPDATE message for this CN domain.

4> if the RLC re-establishment is caused by a reconfiguration message:

5> if only the receiving side of the RLC entity was re-established:

6> set the HFN values for the corresponding RLC entity in downlink equal to the value of the IE "START" that will be included in the reconfiguration complete message for this CN domain.

5> if the whole RLC entity was re-established:

6> set the HFN values for the corresponding RLC entity in uplink and downlink equal to the value of the IE "START" that will be included in the reconfiguration complete message for this CN domain.

1> if the IE "Downlink RLC mode" is present and is set to "UM RLC":

2> if the IE "DL UM RLC LI size" is not present:

3> configure the corresponding RLC entity with an LI size of 7 bits;

NOTE: The case where this mandatory IE is not present is meant to handle the interaction with a network using an earlier release of the specification.

2> else:

3> configure the corresponding RLC entity with the LI size indicated in the IE "DL UM RLC LI size".

2> if the IE "DL Reception Window Size" is present:

3> if the variable UE_CAPABILITY_TRANSFERRED indicates "Support of HS-PDSCH" as "Supported":

4> configure the corresponding RLC entity to support out-of-sequence reception with the receive window size indicated in the IE.

3> if the variable UE_CAPABILITY_TRANSFERRED indicates "Support of HS-PDSCH" as "Unsupported":

4> the UE behaviour is not specified.

2> else:

3> configure the corresponding RLC entity without out-of-sequence reception;

10.3.4.23 RLC info

Information Element/Group name	Need	Multi	Type and reference	Semantics description	Version
CHOICE *Uplink RLC mode*	OP			Indicates if Acknowledged, Unacknowledged or Transparent mode RLC shall be used.	
>AM RLC					
>>Transmission RLC discard	MP		Transmission RLC discard 10.3.4.25		
>>Transmission window size	MP		Integer(1,8,16,32,64,128,256,512,768,1024,1536,2047,2560,3072,3584,4095)	Maximum number of RLC PUs sent without getting them acknowledged. This parameter is needed if acknowledged mode is used. UE shall also assume that the UTRAN receiver window is equal to this value.	
>>Timer_RST	MP		Integer(50, 100, 150, 200, 250, 300, 350, 400, 450, 500, 550, 600, 700, 800, 900, 1000)	Elapsed time in milliseconds. It is used to trigger the retransmission of RESET PDU.	
>>Max_RST	MP		Integer(1, 4, 6, 8, 12 16, 24, 32)	Defined in [16]	
>>Polling info	OP		Polling info 10.3.4.4		
>UM RLC					
>>Transmission RLC discard	OP		Transmission RLC discard 10.3.4.25		
>TM RLC					
>>Transmission RLC discard	OP		Transmission RLC discard 10.3.4.25		
>>Segmentation indication	MP		Boolean	TRUE indicates that segmentation is performed.	
CHOICE *Downlink RLC mode*	OP			Indicates if Acknowledged, Unacknowledged or Transparent mode RLC shall be used	
>AM RLC					
>>DL RLC PDU size	MP		Integer(0..4992 by step of 8)	Unit is bits	REL-5
>>In-sequence delivery	MP		Boolean	TRUE indicates that RLC shall preserve the order of higher layer PDUs when these are delivered. FALSE indicates that receiving RLC entity could allow SDUs to be delivered to the higher layer in different order than submitted to RLC sublayer at the transmitting side.	
>>Receiving window size	MP		Integer(1,8,16,32,64,128,256,512,768,1024,1536,2047,2560,30	Maximum number of RLC PUs allowed to be received. This parameter is needed if acknowledged mode is used. UE shall also assume that the	

Information Element/Group name	Need	Multi	Type and reference	Semantics description	Version
			72,3584,4095)	UTRAN transmitter window is equal to this value	
>>Downlink RLC status Info	MP		Downlink RLC status info 10.3.4.1		
>UM RLC				(No data)	
>>DL UM RLC LI size	MP		Integer(7, 15)	Size in bits to use for the downlink RLC UM LI.	REL-5
>>DL Duplication Avoidance and Reordering info	OP		UM Duplication Avoidance and Reordering info 10.3.4.26		REL-6
>>DL Out of sequence delivery info	OP		UM Out of sequence delivery info 10.3.4.27		REL-6
>>DL Reception Window Size	OP		Integer(32, 48, 64, 80, 96, 112)		REL-6
>TM RLC					
>>Segmentation indication	MP		Boolean	TRUE indicates that segmentation is performed.	
One sided RLC re-establishment	MP		Boolean	TRUE indicates that only one side of the AM RLC entity is re-established.	REL-5

Condition	Explanation
EDCH	This IE is mandatory if the RB has a mapping option on E-DCH, otherwise it is not needed.

NOTE: This information element is included within IE "Predefined RB configuration".

[…]

```
RB-InformationReconfig-r6 ::=       SEQUENCE {
    rb-Identity                         RB-Identity,
    pdcp-Info                           PDCP-InfoReconfig-r4            OPTIONAL,
    pdcp-SN-Info                        PDCP-SN-Info                    OPTIONAL,
    rlc-Info                            RLC-Info-r5r6                       OPTIONAL,
    rb-MappingInfo                      RB-MappingInfo-r6               OPTIONAL,
    rb-StopContinue                     RB-StopContinue                 OPTIONAL
}
```

[…]

```
RLC-Info-r6 ::=                     SEQUENCE {
    ul-RLC-Mode                         UL-RLC-Mode                     OPTIONAL,
    dl-RLC-Mode-r5                      DL-RLC-Mode-r6                  OPTIONAL,
    rlc-OneSidedReEst                   BOOLEAN
}
```

[…]

```
MBMS-CommonRBInformation-r6 ::=     SEQUENCE {
    commonRBIdentity                    MBMS-CommonRBIdentity,
    pdcp-Info                           PDCP-Info-r4,
    rlc-Info                            RLC-Info-r6
}
```

[…]

```
MBMS-MCCH-ConfigurationInfo-r6 ::=  SEQUENCE {
    accessInfoPeriodCoefficient         INTEGER (0..3),
```

```
    repetitionPeriodCoefficient         INTEGER (0..3),
    modificationPeriodCoefficient       INTEGER (7..10),
    rlc-Info                            RLC-Info-r6,
    tctf-Presence                       MBMS-TCTF-Presence                  OPTIONAL
}
[...]

MBMS-MSCHConfigurationInfo-r6 ::=   SEQUENCE {
    mschShedulingInfo                   MBMS-MSCHSchedulingInfo             OPTIONAL,
    rlc-Info                            RLC-Info-r6                         OPTIONAL,
    tctf-Presence                       MBMS-TCTF-Presence                  OPTIONAL
}
[...]

RB-InformationSetup-r6 ::=          SEQUENCE {
    rb-Identity                         RB-Identity,
    pdcp-Info                           PDCP-Info-r4                        OPTIONAL,
    rlc-InfoChoice                      RLC-InfoChoice-r5r6,
    rb-MappingInfo                      RB-MappingInfo-r6
}

[...]

RLC-InfoChoice-r5 ::=                   CHOICE {
    rlc-Info-r5                         RLC-Info-r5,
    same-as-RB                          RB-Identity
}


RLC-InfoChoice-r6 ::=                   CHOICE {
    rlc-Info-r6                         RLC-Info-r6,
    same-as-RB                          RB-Identity
}


[...]

SRB-InformationSetup-r6 ::=         SEQUENCE {
    -- The default value for rb-Identity is the smallest value not used yet.
    rb-Identity                         RB-Identity                         OPTIONAL,
    rlc-InfoChoice                      RLC-InfoChoice-r5r6,
    rb-MappingInfo                      RB-MappingInfo-r6
}
[...]

DL-RLC-Mode-r6 ::=                      CHOICE {
    dl-AM-RLC-Mode-r5                   DL-AM-RLC-Mode-r5,
    dl-UM-RLC-Mode-r5                   DL-UM-RLC-Mode-r6,
    dl-TM-RLC-Mode                      DL-TM-RLC-Mode
}
[...]


DL-UM-RLC-Mode-r6 ::=               SEQUENCE {
    dl-UM-RLC-LI-size                   DL-UM-RLC-LI-size,
    dl-UM-RLC-DuplAvoid-Reord-Info      UM-RLC-DuplAvoid-Reord-Info-r6      OPTIONAL,
    dl-UM-RLC-OutOSeqDelivery-Info      UM-RLC-OutOSeqDelivery-Info-r6      OPTIONAL,
    dl-Reception-Window-Size            DL-Reception-Window-Size-r6         OPTIONAL
}

DL-Reception-Window-Size-r6 ::=     ENUMERATED { size32, size48, size64, size80, size96, size112 }
[...]
```