TSG-RAN Meeting #22 **RP-030616**
Maui, USA, 09-12 December 2003

Title: **CRs (R'99 and linked Rel-4/Rel-5) to TS 25.322.**

Source: **TSG-RAN WG2**

Agenda item: **7.3.3**

Spec	CR	Rev	Phase	Subject	Cat	Version-Current	Version-New	Doc-2nd-Level	Workitem
25.322	248	-	R99	BITMAP and status report content	F	3.16.0	3.17.0	R2-032283	TEI
25.322	249	-	Rel-4	BITMAP and status report content	A	4.10.0	4.11.0	R2-032284	TEI
25.322	250	-	Rel-5	BITMAP and status report content	A	5.6.0	5.7.0	R2-032285	TEI

3GPP TSG-RAN2 Meeting #37
Sophia Antipolis, France 6th to 10th October 2003

Tdoc ⌘R2-032283

CR-Form-v7

CHANGE REQUEST

⌘ **25.322** **CR** **248** ⌘ **rev** **-** ⌘ Current version: **3.16.0** ⌘

*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: ⌘	BITMAP and status report content	
Source: ⌘	RAN WG2	
Work item code: ⌘	TEI	***Date:*** ⌘ September 2003
Category: ⌘	**F**	***Release:*** ⌘ R99

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 has been discussed in RAN2 whether the BITMAP should be considered to be a positive acknowledgement or not. It seems that it would be possible to allow the UE to consider the BITMAP as a positive acknowledgement with one important exception. In section 11.5.2.2 it is stated that each status report should contain positive acknowledgements up to at least SN VR(R). This needs to be done with an ACK SUFI to avoid window stalling (the transmitter window is only advanced due to received ACK SUFIs). Further the current rules on how the end of a STATUS PDU is indicated is confusing (i.e. indicate how to indicate the precense of padding in the end of the STATUS PDU). Depending on how the rules are read it may be impossible to use an ACK SUFI when a status report is segmented into several STATUS PDUs.
Summary of change: ⌘	It is clarified that 1) The BITMAP may be considered to be a positive acknowledgement in the UE. 2) The statement that each status report should contain positive acknowledgements is clarifed to mean that an ACK SUFI shall be included in each status report. This change is particularly important if change 1) is done. 3) The rules for how to indicate the presence of padding in STATUS PDUs is clarified.
Consequences if not approved: ⌘	If the CR is not approved, it is unclear if BITMAPs may be interpreted as positive acknowledgements or not. Depending on the interpretation UEs may not include ACK SUFIs in the status reports leading to a window stall preventing further communication.

Impact analysis:

Impacted functionality:
Correction type: Clarification of a function where the specification is incomplete, ambiguous and/ or inconsistent.

Interoperability:

- Isolated impact: the impact is isolated; only the corrected functionality is affected
- CR implemented only by UTRAN: Stall situations may occur as if the CR was not implemented at all.
- CR implemented only by the UE: Stall situations may occur as if the CR was not implemented at all.

Clauses affected:	⌘	9.2.2.11.5, 11.5.2.2			
		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.

9.2.2.11.5 The Bitmap super-field

The Bitmap Super-Field consists of a type identifier field (BITMAP), a bitmap length field (LENGTH), a first sequence number (FSN) and a bitmap as shown in figure 9.12 below:

Type = **BITMAP**
LENGTH
FSN
Bitmap

Figure 9.12: The Bitmap fields in a STATUS PDU

LENGTH

Length: 4 bits

The size of the bitmap in octets equals LENGTH+1, i.e. LENGTH="0000" means that the size of the bitmap is one octet and LENGTH="1111" gives the maximum bitmap size of 16 octets.

FSN

Length: 12 bits

The "Sequence Number" for the first bit in the bitmap. FSN shall not be set to a value lower than VR(R)-7 when the reception window size is less than half the maximum RLC AM "Sequence Number". If the reception window size is larger, FSN shall not be set to a value lower than VR(R).

Bitmap

Length: Variable number of octets given by the LENGTH field.

Status of the "Sequence Number" fields in the interval [FSN, FSN + (LENGTH+1)*8 - 1] indicated in the bitmap where each position (from left to right) can have two different values (0 and 1) with the following meaning (bit_position∈[0,(LENGTH+1)*8 - 1]):

1: Sequence Number = (FSN + bit_position) has been correctly received.

0: Sequence Number = (FSN + bit_position) has not been correctly received.

The UE may remove AMD PDUs from the transmitter that have been indicated to be correctly received by a BITMAP SUFI. Note that the transmission window is not advanced based on BITMAP SUFIs, see Subclause 9.4.

11.5.2.2 STATUS PDU contents to set

On triggering of a status report, the Receiver shall:

- if the "STATUS prohibit" is not active:
  - include negative acknowledgements for all AMD PDUs detected as missing;
  - include an ACK SUFI positively acknowledging~~ements for~~ all AMD PDUs received up to at least VR(R);
- if an MRW SUFI assembled as specified in subclause 11.6.2.2 had not been sent:
  - optionally include the MRW SUFI;
- if an MRW_ACK SUFI assembled as specified in subclause 11.6.2.2 is awaiting transmission:
  - optionally include the MRW_ACK SUFI;

- if the Sender's transmission window is to be updated:
  - optionally include the WINDOW SUFI;
- if all SUFIs can be accommodated in one STATUS PDU:
  - construct the status report using one STATUS PDU, using one of the allowed PDU sizes;
  - if the SUFIs included do not fill the entire STATUS PDU:
    - if the STATUS PDU is not terminated with an ACK SUFI:
      - terminate the STATUS PDU with a NO_MORE SUFI;
    - use padding in the remainder of the STATUS PDU (padding size may be zero);

  ~~if the SUFIs included do not fill the entire STATUS PDU:~~
  - ~~terminate the STATUS PDU with the ACK or NO_MORE SUFI;~~
  - ~~use padding in the remainder of the STATUS PDU;~~

  ~~otherwise (SUFIs included fill the entire STATUS PDU):~~
  - ~~ACK or NO_MORE SUFIs need not be included in that STATUS PDU;~~
- otherwise (the status report is segmented):
  - construct STATUS PDUs including only complete SUFIs using one of the allowed PDU sizes. The set of STATUS PDUs shall accommodate all the SUFIs to form the complete status report. Indication of the same AMD PDU shall not be given in more than one STATUS PDU of a status report, but the ACK SUFI can be present in more than one STATUS PDU of a status report;
  - if any STATUS PDU constructed is not entirely filled with SUFIs:
    - if the STATUS PDU is not terminated with an ACK SUFI:
      - terminate that STATUS PDU with a NO_MORE SUFI;
    - use padding in the remainder of that STATUS PDU (padding size may be zero)

    ~~terminate that STATUS PDU with the ACK or NO_MORE SUFI;~~
    - ~~use padding in the remainder of that STATUS PDU.~~

    ~~otherwise (SUFIs included fill the entire STATUS PDU):~~
    - ~~ACK or NO_MORE SUFIs should not be included in that STATUS PDU.~~

Which SUFI fields to use is implementation dependent. Bitmap SUFI is used to indicate both received and/or missing AMD PDUs. List SUFI and/or Relative List SUFI are used to indicate missing AMD PDUs only. Acknowledgement SUFI is used to indicate the received AMD PDUs. (For SUFI details see 9.2.2.11.) No information shall be given for AMD PDUs with "Sequence Number"≥VR(H), i.e. AMD PDUs that have not yet reached the Receiver.

3GPP TSG-RAN2 Meeting #37
Sophia Antipolis, France 6th to 10th October 2003

Tdoc ⌘R2-032284

CR-Form-v7

CHANGE REQUEST

⌘ **25.322** **CR** **249** ⌘ **rev** **-** ⌘ Current version: **4.10.0** ⌘

*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: ⌘	BITMAP and status report content	
Source: ⌘	RAN WG2	
Work item code: ⌘	TEI	***Date:*** ⌘ September 2003
Category: ⌘	**A**	***Release:*** ⌘ Rel-4

Use one of the following categories:
F *(correction)*
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Rel-6	*(Release 6)*

Reason for change: ⌘	It has been discussed in RAN2 whether the BITMAP should be considered to be a positive acknowledgement or not. It seems that it would be possible to allow the UE to consider the BITMAP as a positive acknowledgement with one important exception. In section 11.5.2.2 it is stated that each status report should contain positive acknowledgements up to at least SN VR(R). This needs to be done with an ACK SUFI to avoid window stalling (the transmitter window is only advanced due to received ACK SUFIs). Further the current rules on how the end of a STATUS PDU is indicated is confusing (i.e. indicate how to indicate the precense of padding in the end of the STATUS PDU). Depending on how the rules are read it may be impossible to use an ACK SUFI when a status report is segmented into several STATUS PDUs.
Summary of change: ⌘	It is clarified that 1) The BITMAP may be considered to be a positive acknowledgement in the UE. 2) The statement that each status report should contain positive acknowledgements is clarifed to mean that an ACK SUFI shall be included in each status report. This change is particularly important if change 1) is done. 3) The rules for how to indicate the presence of padding in STATUS PDUs is clarified.
Consequences if not approved: ⌘	If the CR is not approved, it is unclear if BITMAPs may be interpreted as positive acknowledgements or not. Depending on the interpretation UEs may not include ACK SUFIs in the status reports leading to a window stall preventing further communication.

Impact analysis:

Impacted functionality:
Correction type: Clarification of a function where the specification is incomplete, ambiguous and/ or inconsistent.

Interoperability:

- Isolated impact: the impact is isolated; only the corrected functionality is affected
- CR implemented only by UTRAN: Stall situations may occur as if the CR was not implemented at all.
- CR implemented only by the UE: Stall situations may occur as if the CR was not implemented at all.

Clauses affected:	⌘	9.2.2.11.5, 11.5.2.2				
		Y	**N**			
Other specs Affected:	⌘		**X**	Other core specifications	⌘	
			X	Test specifications		
			X	O&M Specifications		
Other comments:	⌘					

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The Bitmap Super-Field consists of a type identifier field (BITMAP), a bitmap length field (LENGTH), a first sequence number (FSN) and a bitmap as shown in figure 9.12 below:

Type = **BITMAP**
LENGTH
FSN
Bitmap

Figure 9.12: The Bitmap fields in a STATUS PDU

LENGTH

Length: 4 bits

The size of the bitmap in octets equals LENGTH+1, i.e. LENGTH="0000" means that the size of the bitmap is one octet and LENGTH="1111" gives the maximum bitmap size of 16 octets.

FSN

Length: 12 bits

The "Sequence Number" for the first bit in the bitmap. FSN shall not be set to a value lower than VR(R)-7 when the reception window size is less than half the maximum RLC AM "Sequence Number". If the reception window size is larger, FSN shall not be set to a value lower than VR(R).

Bitmap

Length: Variable number of octets given by the LENGTH field.

Status of the "Sequence Number" fields in the interval [FSN, FSN + (LENGTH+1)*8 - 1] indicated in the bitmap where each position (from left to right) can have two different values (0 and 1) with the following meaning (bit_position∈[0,(LENGTH+1)*8 - 1]):

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The UE may remove AMD PDUs from the transmitter that have been indicated to be correctly received by a BITMAP SUFI. Note that the transmission window is not advanced based on BITMAP SUFIs, see Subclause 9.4.

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- if the Sender's transmission window is to be updated:
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- if all SUFIs can be accommodated in one STATUS PDU:
  - construct the status report using one STATUS PDU, using one of the allowed PDU sizes;
  - if the SUFIs included do not fill the entire STATUS PDU:
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Which SUFI fields to use is implementation dependent. Bitmap SUFI is used to indicate both received and/or missing AMD PDUs. List SUFI and/or Relative List SUFI are used to indicate missing AMD PDUs only. Acknowledgement SUFI is used to indicate the received AMD PDUs. (For SUFI details see 9.2.2.11.)

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Sophia Antipolis, France 6th to 10th October 2003

Tdoc ⌘R2-032285

CR-Form-v7

CHANGE REQUEST

⌘ **25.322** **CR** **250** ⌘ **rev** **-** ⌘ Current version: **5.6.0** ⌘

*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: ⌘	BITMAP and status report content	
Source: ⌘	RAN WG2	
Work item code: ⌘	TEI	***Date:*** ⌘ September 2003
Category: ⌘	**A**	***Release:*** ⌘ Rel-5

Use one of the following categories:
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Reason for change: ⌘ It has been discussed in RAN2 whether the BITMAP should be considered to be a positive acknowledgement or not. It seems that it would be possible to allow the UE to consider the BITMAP as a positive acknowledgement with one important exception. In section 11.5.2.2 it is stated that each status report should contain positive acknowledgements up to at least SN VR(R). This needs to be done with an ACK SUFI to avoid window stalling (the transmitter window is only advanced due to received ACK SUFIs).

Further the current rules on how the end of a STATUS PDU is indicated is confusing (i.e. indicate how to indicate the precense of padding in the end of the STATUS PDU). Depending on how the rules are read it may be impossible to use an ACK SUFI when a status report is segmented into several STATUS PDUs.

Summary of change: ⌘1 It is clarified that

1) The BITMAP may be considered to be a positive acknowledgement in the UE.

2) The statement that each status report should contain positive acknowledgements is clarifed to mean that an ACK SUFI shall be included in each status report. This change is particularly important if change 1) is done.

3) The rules for how to indicate the presence of padding in STATUS PDUs is clarified.

Consequences if not approved: ⌘ If the CR is not approved, it is unclear if BITMAPs may be interpreted as positive acknowledgements or not. Depending on the interpretation UEs may not include ACK SUFIs in the status reports leading to a window stall preventing further communication.

Impact analysis:

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Clauses affected:	⌘	9.2.2.11.5, 11.5.2.2			
		Y	**N**		
Other specs affected:	⌘		**X**	Other core specifications	⌘
			X	Test specifications	
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Other comments:	⌘				

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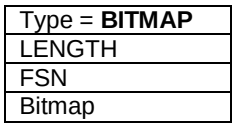

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Status of the "Sequence Number" fields in the interval [FSN, FSN + (LENGTH+1)*8 - 1] indicated in the bitmap where each position (from left to right) can have two different values (0 and 1) with the following meaning (bit_position∈[0,(LENGTH+1)*8 - 1]):

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  - optionally include the MRW_ACK SUFI;
- if the Sender's transmission window is to be updated:

- optionally include the WINDOW SUFI;

- if all SUFIs can be accommodated in one STATUS PDU:
  - construct the status report using one STATUS PDU, using one of the allowed PDU sizes;
  - if the SUFIs included do not fill the entire STATUS PDU:
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  - ~~ACK or NO_MORE SUFIs need not be included in that STATUS PDU;~~

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