

3GPP TSG RAN WG1#104bis_e

R1-2104087

E-meeting, 12th – 20th April 2021

Agenda Item:

8.9.3

Source: Moderator (Sony)

Title: Summary of NWM discussion for
[104b-e-LTE-Rel17_NB_IoT_eMTC-03]

Document for: Discussion

1 Introduction

In RAN1#104e, the following agreement was made:

Agreement

The number of soft channel bits is calculated based on the equation:

$$N_{soft} = N \cdot 96 \cdot \left\lceil \frac{(1736 + 28)}{32} \right\rceil$$

Formula 1:

Working Assumption: N=8

This document captures the NWM discussion that occurred in RAN1#104bis_e. Background information is contained in the initial feature lead summary in R1-2104086.

2 Agreeable proposals

There was broad agreement on the proposals in this NWM discussion.

It is proposed to update the wording of FL proposal 1 (confirming the working assumption on "N = 8"), based on the wording proposed by Ericsson. The updated proposal is hence:

The working assumption on the value of N is confirmed for the calculation of the number of soft channel bits based on the equation:

$$N_{soft} = N \cdot 96 \cdot \left\lceil \frac{(1736 + 28)}{32} \right\rceil$$

Formula 2:

where N = 8.

2.1 [for approval] List of possible agreements

The final list of possible agreements is hence:

Possible agreement 1

The working assumption on the value of N is confirmed for the calculation of the number of soft channel bits based on the equation:

$$N_{soft} = N \cdot 96 \cdot \left\lceil \frac{(1736 + 28)}{32} \right\rceil$$

Formula 3:

where N = 8

Possible agreement 2

The soft channel bits for UEs supporting maximum DL TBS of 1736 bits is 43008 bits.

Possible agreement 3

Send an LS to RAN2 informing them of RAN1's decisions on the following:

- The soft channel bits for UEs supporting maximum DL TBS of 1736 bits is 43008 bits.
- The 1736 bits DL TBS feature is enabled by unicast RRC configuration.

If companies have any issues with the possible agreements above, please indicate in the feedback form below:

2.1.1 Feedback on list of possible agreements

Feedback Form 1: Feedback on possible agreements

Item	Company	Comments

3 Discussion

The following issues were raised in the input Tdocs to RAN1#104bis_e:

3.1 Working assumption on N=8/ soft buffer size

FL Summary

The working assumption that N=8 can be confirmed based on the following considerations.

Precedence. N=8 was used for 10 HARQ processes were introduced in Rel-14. N=8 is going to be used for 14 HARQ processes in Rel-17. We should hence still use N=8 for this feature.

Performance. Simulations showed that there was very little performance impact from basing the number of soft channel bits on more than N=8 HARQ processes. There is a very low probability that more than 8 HARQ processes fail successively. Hence little performance impact.

Complexity. More than 8 HARQ processes increases complexity.

All input documents agreed that the working assumption of “N = 8” could be agreed.

FL Proposal 1:

In the calculation where the number of soft channel bits is calculated based on the equation:

$$N_{soft} = N \cdot 96 \cdot \left\lceil \frac{(1736 + 28)}{32} \right\rceil$$

Formula 4:

Confirm the working assumption that N = 8.

FL Proposal 2:

The soft channel bits for UEs supporting maximum DL TBS of 1736 bits is 43008 bits.

3.1.1 [locked] Feedback on number of soft channel bits proposals

Do you agree with FL proposal 1 (confirm the working assumption that N = 8)?

Do you agree with FL proposal 2 (number of soft channel bits is 43008 bits)?

Feedback Form 2: Feedback on number of soft channel bits proposals

Item	Company	Comments
1	Sony Europe B.V.	[SONY] Agree to both FL proposals 1 and 2.
2	Lenovo (Beijing) Ltd	We agree with the two proposals
3	Qualcomm Incorporated	Agree to both proposals.
4	ZTE Corporation	Yes
5	Ericsson Japan K.K.	The WA was on $N = 8$, Proposal 1 was already agreed in the previous e-meeting (See Chairman Notes RAN1# 104-e). Hence only proposal 2 needs to be agreed (we are ok with proposal 2).
6	Sony Europe B.V.	[SONY2] In response to Ericsson's comment, the "action part" of proposal 1 is to confirm the working assumption. The text with the equation in it just provides the context for being able to say "confirm the working assumption about $N=8$ from the last meeting". I'd like to complete the AI without any hanging working assumptions. Would it be possible to reconsider and agree to proposal 1?
7	Nokia	[Nokia] Agree to both proposals. Agree with Sony we need to confirm the WA.
8	Ericsson Japan K.K.	Thanks Feature Lead, I see your intention, but in that case could we start Proposal 1 having under it " Confirm the working assumption that $N = 8$, which is used to determine the number of soft channel bits calculated based on the equation: " It also seems to improve the wording because proposal 1 says "In the calculation ... is calculated". Thanks!
9	Sierra Wireless, S.A.	Agree to both proposals.
10	Nordic Semiconductor ASA	Agree to both proposals
11	Sony Europe B.V.	Ericsson's update looks good, as also posted on email. I suggest we go with Ericsson's wording (which will be in the updated version of this NWM).

3.2 RAN2 Impacts

FL Summary

The RAN1 decision on the number of soft channel bits for support of a DL TBS of 1736 needs to be conveyed to RAN2 via an LS. The actual implementation of the number of soft channel bits in the RAN2 TS36.306 specification can be left to RAN2. The following text from Sierra Wireless (including Note 4) seems appropriate. This text proposal can be made in RAN2, once RAN2 have received the LS from RAN1.

Table 1: Example of how number of soft channel bits for 1736 bit DL TBS can be implemented in TS36.306

UE DL Category	Maximum number of DL-SCH transport block bits received within a TTI (Note 1)	Maximum number of bits of a DL-SCH transport block received within a TTI	Total number of soft channel bits	Maximum number of supported layers for spatial multiplexing in DL
DL Category M1 Note 4	1000 or 1736	1000 or 1736	25344 or 43008	1

NOTE 4: The UE supports "Maximum number of DL-SCH transport block bits transmitted within a TTI" and "Maximum number of bits of an DL-SCH transport block transmitted within a TTI" of 1736 bits if the UE indicates support of *{Feature_Name_DL_1736_TBS}* and otherwise the UE supports 1000 bits. The UE supports "Total number of soft channel bits" of 43008 bits if the UE indicates support of *{Feature_Name_DL_1736_TBS}* and otherwise the UE supports 1000 bits.

When sending an LS, RAN1 should include a RAN2-impacting agreement from RAN1#104e:

The 1736 bits DL TBS feature is enabled by unicast RRC configuration.

The question remains as to the timing of sending an LS to RAN2. While the LS could be sent at the conclusion of the work item, it may be beneficial to inform RAN2 as soon as RAN1 has made this decision. This allows RAN1 work on this topic to be concluded and RAN2 to get a head start on their specification.

FL Proposal 3:

During RAN1#104bis_e, send an LS to RAN2 informing them of RAN1's decisions on the following:

- The soft channel bits for UEs supporting maximum DL TBS of 1736 bits is 43008 bits.
- The 1736 bits DL TBS feature is enabled by unicast RRC configuration.

3.2.1 [locked] Feedback on RAN2 impacts proposals

Do you agree with FL proposal 3?

If not, which of the following aspects are problematic?

- sending an LS in RAN1#104bis_e
- additionally including the RAN1#104e agreement on unicast RRC configuration

Feedback Form 3: Feedback on sending LS to RAN2

Item	Company	Comments
1	Sony Europe B.V.	[SONY] Agree to FL proposal 3.
2	Lenovo (Beijing) Ltd	Agree with proposal 3
3	Qualcomm Incorporated	We should also add in the LS that the feature for 1736 bits is an optional UE capability.
4	Ericsson Japan K.K.	We are OK with the LS. About the comment on the "UE capability", perhaps we can use the wording as in the WID "Add a Rel-17 optional UE capability to support a maximum DL TBS of 1736 bits for HD-FDD Cat. M1 UEs in CE mode A only".
5	ZTE Corporation	It is not necessary to send an LS. But we are fine if other companies agree to send.
6	Sony Europe B.V.	[SONY2] I tend to think that RAN2 will understand from the WID that 1736 bits is an optional capability. However, we are OK with including this information in the single LS.
7	Nokia	[Nokia] Agree with the proposal.
8	Sierra Wireless, S.A.	Agreed

3.3 Further work required on AI 8.9.3.

FL Summary

Once the soft buffer size has been decided, this AI can be closed. Any further issues can be addressed in the “others” AI.

The chairman can make a decision on whether to include AI8.9.3 in future meetings and there does not need to be explicit agreement on this point.