Email discussion summary for [RAN-R18-WS-non-eMBB-Sharp] - Version 0.0.4
RAN

3GPP TSG RAN Rel-18 Workshop **RWS-210594**

Electronic Meeting, June 28 - July 2, 2021

Agenda Item: **4.2**

Source: **Sharp**

Title: **Email discussion summary for [RAN-R18-WS-non-eMBB-Sharp]**

Document for: **Discussion**

1 Introduction

This document is intended to capture questions and comments raised from interested companies regarding Sharp's contributions to Rel-18 Workshop on agenda item 4.2, and provide answers to those questions and comments. Your feedback is very much appreciated.

This discussion covers the following documents:

Table 1: Sharp's contributions to RAN Rel-18 Workshop on agenda item 4.2

TDoc	Title	Source	Agenda Item
RWS-210221	Support of Non GNSS capable devices in NTN systems	Sharp	4.2
RWS-210222	Views on further sidelink enhancements in Rel-18	Sharp	4.2
RWS-210223	Views on Rel-18 RedCap enhancements	Sharp	4.2

2 General

2.1 General comments

Feedback Form 1: General comments

2.2 Answers to general comments

No general comment was received.

3 NTN (RWS-210221)

3.1 Round 1 questions

Feedback Form 2: Round 1 questions on NTN

1 – Asia Pacific Telecom co. Ltd

We share the same view that non-GNSS UE shall be supported. However, UE location may be needed for higher layers. We wonder whether we shall support UE with GNSS but without UL timing/freq. pre-compensation capability in Rel-18.

2 – Rakuten Mobile

We support the proposal of Support UE's without GNSS capabilities or GNSS information in Rel-18.

This will most likely result in supporting UE's without UL time/freq pre-compensation.

3 – Lenovo (Beijing) Ltd

Thanks for the contribution. It seems that UE without GNSS is a promosing trend in Rel.18 NTN. However, I am wondering the UE without GNSS is targeted for 1) NR UE or 2) both NR and IoT UE in your study.

If UE w/o GNSS, how do you think the IoT device achieve the position information? Position feature is important for IoT device.

4 – Intel Corporation (UK) Ltd

Q1: Do you consider to support NR NTN without GNSS for all the cases including LEO, MEO and GEO or for particular scenarios?

Q2: For LEO operation without GNSS at the UE, do you expect that frequent PRACH transmission will be required to maintain the TA?

3.2 Round 1 answers

Table 2: Round 1 answers on NTN

Question/Comment on	From	Answer

UL timing/freq pre-compensation	APT, Rakuten	The study will likely try to preserve UL time/freq pre-compensation, as a lack of either results in major rework. Determining if this can be done is one goal of the study. Specifically to APT's concern, when we wrote the proposal, we wanted to support GNSS devices wherein GNSS is unavailable for whatever reason, in addition to devices without GNSS. We are fine if this is called out explicitly in the study.
Supporting the proposal	Rakuten	Thanks for your support. The study will likely try to preserve UL time/freq pre-compensation, as a lack of either results in major rework. Determining if this can be done is one goal of the study.
Only NR or IoT as well	Lenovo	We are targeting both NR and IoT. The proposal has comments towards both applications.
Which scenarios	Intel	We wish to support all scenarios. The study will hopefully uncover difficulties in any scenario, and solutions. LEO is receiving much commercial attention now, so it is very desirable to support it. GEO results in very little Doppler and very little delay drift, which will ease supporting it.
PRACH	Intel	We do not expect frequent PRACH transmissions. We expect the study to first examine if TA pre-compensation is possible without GNSS, so that we do not rely on PRACH for large TA compensation. However, if we rely on PRACH for TA, the first PRACH transmission will establish the bulk of the compensation needed. New PRACH will be needed upon handover, but that is normal operation.

3.3 Round 2 questions

Feedback Form 3: Round 2 questions on NTN

3.4 Round 2 answers

No Round 2 question was received on NTN, and no answer is necessary.

4 Sidelink (RWS-210222)

4.1 Round 1 questions

Feedback Form 4: Round 1 questions on Sidelink

1 – Classon Consulting

[for FUTUREWEI]

We also support sidelink MIMO and FR2 enhancements, see RWS-210039 and https://nwm-trial.etsi.org/#/documents/471
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2 – LG Electronics Inc.

Q: Can you elaborate on the motivation of ”PSFCH formats supporting more than 1 bit?” Is it to acknowledge the reception of multiple TBs using a single PSFCH?

3 – Huawei Tech.(UK) Co.. Ltd

Q1: Does the proposed multiplexing of PSFCH with PSCCH/PSSCH in frequency domain in Rel-18 intend to co-exist with Rel-16/17 where we have TDMed PSFCH in the same RP?

Q2: Does pg. 5 intend to say that FR2 sidelink should be restricted to unicast only?

4 – Qualcomm Incorporated

1. What payload would be carried in the > 1 bit PSFCH formats?
2. In intra-UE preemption, are the resources selected and reserved or selected and not reserved?

5 – Lenovo (Beijing) Ltd

Q1: In Page 3 why multi-carrier operation is only applied for unicast?

6 – CATT

”Enhancements for FR2” is listed under ”Performance enhancements on sidelink coverage”, is the intention to enhance coverage for FR2?

4.2 Round 1 answers

Table 3: Round 1 answers on Sidelink

Question/Comment on	From	Answer
Supporting sidelink MIMO and FR2 enhancements	FUTUREWEI	Thanks for highlighting RWS-210039 and corresponding email discussions. We raised a few questions there.
PSFCH formats supporting more than 1 bit	LG, QC	The thinking was to enable e.g. piggybacking of CSI report for the opposite unicast link, but what LG mentioned could be another benefit of supporting more than one bit.
Multiplexing of PSFCH with PSCCH/PSSCH in frequency domain	HW	Yes, it was intended to be backward compatible with Rel-16/Rel-17. A Rel-16/Rel-17 UE is not expected to correctly receive the multiplexed PSSCH/PSFCH.
FR2 “restricted to unicast only”	HW	No. The intention was that “beamformed transmission” (which is proposed to be introduced for FR2) is only supported for unicast.
Intra-UE preemption	QC	In our view, at least “selected and not reserved” should be supported. For “selected and reserved” we understand companies may have different views on how legacy RX UE may assume on the reserved resources.
Multi-carrier operation	Lenovo	The main consideration here is backward compatibility with legacy UEs. Additional carriers can be coordinated via PC5-RRC for unicast, without any negative impact to legacy UEs.
Whether to “enhance coverage for FR2”	CATT	Our view is that coverage is a problem (rather than something “better to enhance”) for sidelink on FR2.

4.3 Round 2 questions

Feedback Form 5: Round 2 questions on Sidelink

1 – Huawei Tech.(UK) Co.. Ltd

Thanks for the responses. Will this Rel-18 FDMed PSSCH/PSFCH resource be indicated in Rel-18 SCI, or by explicit mapping between PSSCH and PSFCH similar to Rel-16?

4.4 Round 2 answers

Table 4: Round 2 answers on Sidelink

Question/Comment on	From	Answer
Indication of FDM'ed PSSCH/PSFCH	HW	Thanks for the question. We think this can be indicated in the 1st stage SCI. A new, semi-static mapping (which cannot be used by Rel-16/Rel-17 UEs) is also possible, but we wonder if it is an efficient way of utilizing resources.

5 RedCap (RWS-210223)

5.1 Round 1 questions

Feedback Form 6: Round 1 questions on RedCap

1 – ZTE Corporation

Thanks for the proposals on RedCap.

For 'RRM relaxation for serving cell', considering that "RRM relaxation for serving cell" was excluded in Rel-17 RedCap WI, could you elaborate more about the motivation to consider it in Rel-18?

2 – Spreadtrum Communications

Thanks for the nice contribution. As you mentioned in your slides, more use cases should be one of the motivations to enhance RedCap. We are very interested in use case extensions, what are the detailed use cases should be considered in Rel.18 from your perspective, and how to define the KPI of those new use cases?

Besides, for the UL enhancement, what's the different between "One DCI for multiple UL grants" and scheduling of multiple TBs (specified for eMTC in Rel.16)?

3 – Sony Europe B.V.

Slide 4: The R17 study determined that 20MHz BW was a sweetspot for UE redcap bandwidth capability. What percentage further complexity reduction do you expect with a 5/10MHz UE bandwidth?

Slide 5: Higher reliability. Is the goal to improve coverage or to reduce latency?

4 – Ericsson LM

Regarding further reduced UE bandwidth (RWS-210223), we would like to ask what potential UE cost reduction you expect from reduction from 20 MHz to 5-10 MHz? The estimates from CATT (RWS-210409) and Ericsson (RWS-210313) indicate that according to the established cost evaluation methodology (TR 38.875), there may not be a very significant further cost reduction compared to 20 MHz.

5 – LG Electronics Inc.

Thanks for the contribution.

Q1) For the throughput enhancements, do you see it necessary to increase the throughput of RedCap UEs given the peak rates can already reach already up to 150Mbps for DL by optional UE capability. Or, if not, is the proposal mainly targeted for TDD?

6 – Samsung Electronics Co.

What are the new use cases and which proposed improvements are driven by the new use cases?

7 – Intel Corporation (UK) Ltd

Q1: How to motivate introducing further reduced BW UEs for FR2 when the minimum complexity associated with support of FR2 bands would likely offset the simplifications from BW reduction only?

Q2: ”Beam management optimizations for stationary UEs” may need some further clarifications as in general, beam management procedures can be necessary also for stationary UEs due to changes in the environment. Also, are such optimizations intended for 100 MHz FR2 RedCap UEs or only the new further reduced BW FR2 RedCap UEs, if introduced?

5.2 Round 1 answers

Table 5: Round 1 answers on RedCap

Question/Comment on	From	Answer
RRM relaxation	ZTE	Thanks for the question. We think RRM relaxation for connected mode can save power at least for the stationary device with good coverage, e.g in a factory, and there are no negative impacts on the mobility performance which was the main concern in Rel-17

Use case extension	Spreadtrum, Samsung	We expect the lower cost devices mainly for industry including sensors/surveillances/smart meters and so on as low-end devices. For that, the throughput can be higher than MTC/NB-IoT devices and lower than Rel-17 RedCap (e.g. 1 20Mbps). In the use cases, further cost reduction and/or UL enhancement may be considered.
UL grant	Spreadtrum	Yes, there are some similarities between them, and the detailed studies such as DCI and HARQ design etc. can be considered in Rel-18.
Complexity reduction	Sony, Ericsson	We agree Rel-17 RedCap achieved the one of the milestones for the cost reduction. On the other hand, for IoT market, further cost reduction will be desirable and about 10% reduction by BW will be expected. We also understand some impacts by segmentation from Rel-17 RedCap may occur and further consideration in this workshop will be needed.
Reliability	Sony	Thanks for the question, coverage enhancement and latency reduction can both be studied in Rel-18 for some scenarios.
Throughput enhancement	LG	We are not sure some devices (e.g. high-end wearables and/or low-end smartphone) can be covered by Rel-15/16 and Rel-17 RedCap enough. Therefore, if they are needed, some enhancement can be studied.
BW reduction in FR2	Intel	At least we assume cost reduction in FR1 can be considered. However, if needed for FR2, we don't have strong preference on the cost reduction by the BW reduction.

Beam management	Intel	We agree with the necessity of beam management for stationary UEs, and some simplification can be studied to minimize the power consumption, such as longer report period, fewer TCI states, etc. This is intended for all FR2 RedCap UEs.

5.3 Round 2 questions

Feedback Form 7: Round 2 questions on RedCap

1 – ZTE Corporation

Thanks for Round 1 answer. For 'RRM relaxation for serving cell', we still have some concerns.

For serving cell measurement in RRC_IDLE/INACTIVE state, we understand it was excluded from Rel-17 because companies haven't identified effective serving cell RRM relaxation method without impacting IDLE/INACTIVE behaviour (e.g. Paging).

On the other hand, the quality of serving cell measurement is used in "stationary criterion" evaluation. If serving cell measurement relaxation is applied, the transition from "relaxed mode" to "normal mode" may be delayed and affects mobility performance So we are afraid serving cell measurement relaxation cannot bring benefit as expected.

5.4 Round 2 answers

Table 6: Round 2 answers on RedCap

Question/Comment on	From	Answer
RRM relaxation	ZTE	Thanks for your comments. For RRC_IDLE/INACTIVE UEs, we consider the eDRX has done relaxation virtually for some cases. Mobility performance may not be a big issue for the cases which are indicated as 'stationary'.

6 Email Discussion Summary

Thank you for all the questions/comments, which were addressed within the email discussion.

On general aspects, no question/comment was received.

On NTN, during Round 1 Q&A, 5 questions/comments were received from 4 companies, and during Round 2

Q&A, no question/comment was received.

On Sidelink, during Round 1 Q&A, 7 questions/comments were received from 6 companies, and during Round 2 Q&A, 1 question was received from 1 company.

On RedCap, during Round 1 Q&A, 8 questions/comments were received from 7 companies, and during Round 2 Q&A, 1 comment was received from 1 company.

Answers have been provided to the above mentioned questions/comments.