

RAN-R18-WS-eMBB-LG Uplus - Version 0.0.6
RAN

3GPP TSG-RAN Rel-18 Workshop

Electronic meeting, June 28 - July 2, 2021

RWS-210533

Agenda Item: 4.1 eMBB

Source: LG Uplus

Title: Email discussion summary for [RAN-R18-WS-eMBB-LG Uplus]

1 Introduction

This discussion paper intends to summarize the comments and questions from various companies about the LG Uplus' view of Rel-18 desired features (**RWS-210275**). Our slide deck consists of 6 slides, the contents of which are as following;

- [Slide #1] Overview of current 5G eMBB issues
- [Slide #2] Edge Throughput Enh.: Distributed MIMO & Beam management enh.
- [Slide #3] Mobility Enh.: Cell change latency reduction for DC
- [Slide #4] O2I Coverage Enh.: UL Coverage enhancement
- [Slide #5] O2I Coverage Enh.: Beamforming Repeater
- [Slide #6] SON Enh.: ANR/MDT enhancement AI-based SON

As for each slide, comments and questions will be received from companies over two rounds planned. We will correspondingly construct responses by tabulated form in comprehensive manner. All the results would be **locked and summarized at 24th June** before submitted at into workshop on-line meeting (due: June 25 18:00 UTC).

Note: We recommend left-side navigation column for quickly accessing target clause.

2 General or Slide #1 "5G eMBB issues"

This clause will receive comments and questions from companies for general review about overall slide deck or slide #1 "5G eMBB issues description".

2.1 Round 1 Questions/Comments

**Feedback Form 1: Round1 Questions/Comments on Slide 1
"5G eMBB issues"**

2.2 Round 1 Response from LG Uplus

Table 1: Round 1 Response from LG Uplus on Slide #1 "5G eMBB issues"

Questions	Response from LG Uplus

2.3 Round 2 Questions/Comments

**Feedback Form 2: Round 2 Questions/Comments on Slide 1
"5G eMBB issues"**

2.4 Round 2 Response from LG Uplus

Table 2: Round 2 Response from LG Uplus on Slide #1 "5G eMBB issues"

Questions	Response from LG Uplus

3 Slide #2 "Edge Throughput Enh.: Distributed MIMO & Beam management enh"

3.1 Round 1 Questions/Comments

**Feedback Form 3: Round 1 Questions/Comments on Slide 2
"Edge Throughput Enh.: Distributed MIMO Beam management enh."**

<p>1 – Samsung Research America</p> <ul style="list-style-type: none">- (p3) We have similar view on the scenario considering distributed AUs in FDD low band. Regarding the distributed MIMO & beam management enh. could you elaborate more on the following things?- 1. How many AUs do you consider?- 2. What's the expected phase difference among AUs? Is measuring the phase difference between each antenna of each AU critical (it can be varied based on determining the set of AUs)?
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<p>2 – NTT DOCOMO INC.</p> <p>In P7, for 'e.g. more than 2 TRPs, combined multi-TRP schemes', do you mean DL NCJT or CJT? single-DCI based or multi-DCI based DL MTRP schemes?</p>
<p>3 – NTT DOCOMO INC.</p> <p>Sorry. Please ignore my previous question, which I input into a wrong place. Following please find the questions. For CJT scheme, is it based on single-DCI or multi-DCI scheduling? Does UE need to measure phase difference between two RUs/AUs and report to NW?</p>
<p>4 – Intel Corporation (UK) Ltd</p> <p>Do you have evaluation results showing benefits of coherent JT over other mTRP schemes in such deployment scenarios?</p>
<p>5 – Huawei Tech.(UK) Co.. Ltd</p> <p>Thank you for the contribution. We agree that DL mTRP with coherent joint transmission is needed to overcome the limitations on placing more antennas at one site. We have identified several specification impacts for CJT in RWS-210437. We have one question on the proposed CS overhead reduction. In our understanding CSI for CJT requires a new CSI design, it is not simply a matter of reusing existing CSI with reduced overhead. Could you clarify?</p>

3.2 Round 1 Response from LG Uplus

Table 3: Round 1 Response from LG Uplus on Slide #2 "Edge Throughput Enh.: Distributed MIMO & Beam management enh."

Questions	Response from LG Uplus
Samsung	<p>[LG U+] Thanks for your questions and Sorry for late response.</p> <p>1. How many AUs do you consider?</p> <p>[LG U+] Initially, we consider the maximum number of AUs is 8 which number is based on 256/32, where 256 is the target of maximum number of physical antennas and 32 is the minimum number of physical antennas for now. We also consider the number of physical antennas as an AU is 64 or 128.</p> <p>2. What's the expected phase difference among AUs? Is measuring the phase difference between each antenna of each AU critical (it can be varied based on determining the set of AUs)?</p> <p>[LG U+] We don't know the exact expected phase difference so far. However, it is experienced in indoor circumstances that the calibration of phase difference is key aspect for coherent distributed MIMO. Phase difference would be further for outdoor circumstances.</p>

NTT DOCOMO	<p>[LG U+] Thanks for your questions and Sorry for late response.</p> <p>1. For CJT scheme, is it based on single-DCI or multi-DCI scheduling?</p> <p>[LG U+] We think that multi-DCI scheduling would be sufficient for the first stage. Of course, single DCI would be better but we worry about performance degradation in some cases (e.g. DCI bit padding issue, etc.) and late ecosystem due to implementation complexity.</p> <p>2. Does UE need to measure phase difference between two RUs/AUs and report to NW?</p> <p>[LG U+] Measuring phase difference is key aspect to us. For TDD, report by UE would be deprioritized. Meanwhile, for FDD, we think it should be there.</p>
Intel	<p>[LG U+] Thanks for your questions and Sorry for late response.</p> <p>1. Do you have evaluation results showing benefits of coherent JT over other mTRP schemes in such deployment scenarios?</p> <p>[LG U+] We have some real statistics results for indoor circumstances and, however, the value is not disclosed. It is quite big. We can discuss it further through offline.</p>
Huawei	<p>[LG U+] Thanks for your questions and Sorry for late response.</p> <p>1. We have one question on the proposed CS overhead reduction. In our understanding CSI for CJT requires a new CSI design, it is not simply a matter of reusing existing CSI with reduced overhead. Could you clarify?</p> <p>[LG U+] Study and test will be required in order to proceed detail design when item is endorsed. We think that finer granularity of precoding matrix is desired for sufficient performance gain and additional precoding matrix with phase compensation information would be needed. Correspondingly, CSI overhead reduction solution could be needed.</p>

3.3 Round 2 Questions/Comments

**Feedback Form 4: Round 2 Questions/Comments on Slide 2
"Edge Throughput Enh.: Distributed MIMO Beam management enh."**

1 – Samsung Research America

(p3) Regarding phase difference among RRHs, if this aspect is considered, do you have any method-s/schemes for compensating (measuring/reporting) the phase difference in mind?

3.4 Round 2 Response from LG Uplus

Table 4: Round 2 Response from LG Uplus on Slide #2 "Edge Throughput Enh.: Distributed MIMO & Beam management enh."

Questions	Response from LG Uplus
Samsung	1) Regarding phase difference among RRHs, if this aspect is considered, do you have any method-s/schemes for compensating (measuring/reporting) the phase difference in mind? [LG U+] Regarding TDD configuration, we guess SRS is preferred and the coverage enhancement of SRS (broad bandwidth) could be desired. Regarding FDD configuration and the area out of coverage of SRS in TDD, CSI report with finer codebook and additional phase difference report over multiple TRPs are desired.

4 Slide #3 "Mobility Enh.: Cell change latency reduction for DC"

4.1 Round 1 Questions/Comments

Feedback Form 5: Round 1 Questions/Comments on Slide 3 "Mobility Enh.: Cell change latency reduction for DC"

1 – Apple Hungary Kft.

For the proposals provided, can you confirm that even with multiple SCGs, only one SCG is active at a time?

4.2 Round 1 Response from LG Uplus

Table 5: Round 1 Response from LG Uplus on Slide #3 "Mobility Enh.: Cell change latency reduction for DC"

Questions	Response from LG Uplus
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Apple	<p>[LG U+] Thanks for your questions and Sorry for late response.</p> <p>1) For the proposals provided, can you confirm that even with multiple SCGs, only one SCG is active at a time?</p> <p>[LG U+] For Rel-18, one SCG is sufficient to us. We need to monitor specification evolution for later release.</p>

4.3 Round 2 Questions/Comments

Feedback Form 6: Round 2 Questions/Comments on Slide 3 "Mobility Enh.: Cell change latency reduction for DC"

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4.4 Round 2 Response from LG Uplus

Table 6: Round 2 Response from LG Uplus on Slide #3 "Mobility Enh.: Cell change latency reduction for DC"

Questions	Response from LG Uplus

5 Slide #4 "O2I Coverage Enh.: UL Coverage enhancement"

5.1 Round 1 Questions/Comments

Feedback Form 7: Round 1 Questions/Comments on Slide 4 "O2I Coverage Enh.: UL Coverage enhancement"

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5.2 Round 1 Response from LG Uplus

Table 7: Round 1 Response from LG Uplus on Slide #4 "O2I Coverage Enh.: UL Coverage enhancement"

5.3 Round 2 Questions/Comments

**Feedback Form 8: Round 2 Questions/Comments on Slide 4
"O2I Coverage Enh.: UL Coverage enhancement"**

5.4 Round 2 Response from LG Uplus

**Table 8: Round 2 Response from LG Uplus on Slide #4 "O2I
Coverage Enh.: UL Coverage enhancement"**

Questions	Response from LG Uplus

6 Slide #5 "O2I Coverage Enh.: Beamforming Repeater"

6.1 Round 1 Questions/Comments

**Feedback Form 9: Round 1 Questions/Comments on Slide 5
"O2I Coverage Enh.: Beamforming Repeater"**

6.2 Round 1 Response from LG Uplus

**Table 9: Round 1 Response from LG Uplus on Slide #5 "O2I
Coverage Enh.: Beamforming Repeater"**

Questions	Response from LG Uplus

6.3 Round 2 Questions/Comments

**Feedback Form 10: Round 2 Questions/Comments on Slide 5
"O2I Coverage Enh.: Beamforming Repeater"**

6.4 Round 2 Response from LG Uplus

**Table 10: Round 2 Response from LG Uplus on Slide #5 "O2I
Coverage Enh.: Beamforming Repeater"**

7 Slide #6 "SON Enh.: ANR/MDT enhancement AI-based SON"

7.1 Round 1 Questions/Comments

Feedback Form 11: Round 1 Questions/Comments on Slide 6 "SON Enh.: ANR/MDT enhancement AI-based SON"

<p>1 – ZTE Corporation</p> <p>Actually, parts of SON (e.g. MRO) has already been discussed in Rel-17 and captured into TR. It can be further discuss which other part of SON/MDT/ANR can be considered.</p> <p>SON/MDT procedure may be as the baseline for AI data collection.</p>

7.2 Round 1 Response from LG Uplus

Table 11: Round 1 Response from LG Uplus on Slide #6 "SON Enh.: ANR/MDT enhancement AI-based SON"

Questions	Response from LG Uplus
ZTE	<p>[LG U+] Thanks for your questions and Sorry for late response.</p> <p>1. Actually, parts of SON (e.g. MRO) has already been discussed in Rel-17 and captured into TR. It can be further discuss which other part of SON/MDT/ANR can be considered. SON/MDT procedure may be as the baseline for AI data collection.</p> <p>[LG U+] Yes, ANR/MDT should be the baseline for AI data collection. Hence, we propose that ANR/MDT should be mandatory feature in Rel-18. M1(RSRP,RSRQ,SINR) and M2 is prioritized to us.</p>

7.3 Round 2 Questions/Comments

**Feedback Form 12: Round 2 Questions/Comments on Slide 6
"SON Enh.: ANR/MDT enhancement AI-based SON"**



7.4 Round 2 Response from LG Uplus

Table 12: Round 2 Response from LG Uplus on Slide #6 "SON Enh.: ANR/MDT enhancement AI-based SON"

Questions	Response from LG Uplus

8 Summary

The sum-up of this email discussion is as followings;

Table 13:

Topics	Questions	Responses
General	N/A	N/A
Edge Throughput Enh.: Distributed MIMO & Beam management enh.	Most companies are interested in the view of enabling technologies for Distributed MIMO. Especially, it is asked how to compensate phased differences over multiple TRPs.	We suggested enhanced SRS coverage for broad bandwidth, finer codebook based CSI report, additional phase difference report over multiple TRPs.
Mobility Enh.: Cel change latency reduction for DC	One company asked how many SCGs are considered in DAPS.	We reponded that Our first priority is one SCG.
O2I Coverage Enh.: UL Coverage enhancement	N/A	N/A
O2I Coverage Enh.: Beamforming Repeater	N/A	N/A
SON Enh.: ANR/MDT enhancement AI-based SON	One company asked which feature enhancements are desired.	Our first purpose is to make M1/M2 features mandatory for enabling AI based SON in Rel-18. And, more flexible measurement configuration per beam is suggested in order to enable erroneous beam detection.