3GPP TSG-RAN WG3 #112-e draft R3-212601

**May 17-28, 2021**

**Online**

**Agenda item: 8.1**

**Source: Samsung (moderator)**

**Title: Summary of offline discussion on CB: # 3\_L1-L2-Mobility**

**Document for: Approval**

# Introduction

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| **CB: # 3\_L1-L2\_Mobility**  **- Focus on Intra-DU; inter-DU case has a considerable functional impact with no clear benefit**  **- Wait for RAN2 progress**  **- Recommendations to RAN1/RAN2: allow transmission toward cells with different C-RNTI; clarify terminology (“non-serving cell”)?**  **- check details**  **- agree reply LS**  (SS - moderator)  [NWM] Summary of offline disc |

Relevant contributions:

[1] [R3-211415](file:///D:\Work\3GPP\RAN3\RAN3%23112e(202105)\Drafts\CB%20%23%203_L1-L2_Mobility\Docs\R3-211415.zip) LS on TCI State Update for L1/L2-Centric Inter-Cell Mobility (RAN1)

[2] [R3-211946](file:///D:\Work\3GPP\RAN3\RAN3%23112e(202105)\Drafts\CB%20%23%203_L1-L2_Mobility\Docs\R3-211946.zip) Discussion on L1/L2-centric inter-cell mobility (Samsung)

[3] [R3-212308](file:///D:\Work\3GPP\RAN3\RAN3%23112e(202105)\Drafts\CB%20%23%203_L1-L2_Mobility\Docs\R3-212308.zip) Discussion on L1/L2 inter cell mobility (Ericsson)

[4] [R3-212307](file:///D:\Work\3GPP\RAN3\RAN3%23112e(202105)\Drafts\CB%20%23%203_L1-L2_Mobility\Docs\R3-212307.zip) Reply LS on TCI State Update for L1/L2-Centric Inter-Cell Mobility (Ericsson)

[5] [R3-211793](file:///D:\Work\3GPP\RAN3\RAN3%23112e(202105)\Drafts\CB%20%23%203_L1-L2_Mobility\Docs\R3-211793.zip) Discussion on L1/L2-Centric Mobility (Nokia, Nokia Shanghai Bell)

[6] [R3-212592](file:///D:\Work\3GPP\RAN3\RAN3%23112e(202105)\Drafts\CB%20%23%203_L1-L2_Mobility\Docs\R3-212592.zip) [draft] Response LS on TCI State Update for L1/L2-Centric Inter-Cell Mobility (Nokia, Nokia Shanghai Bell)

[7] [R3-212510](file:///D:\Work\3GPP\RAN3\RAN3%23112e(202105)\Drafts\CB%20%23%203_L1-L2_Mobility\Docs\R3-212510.zip) Discussion on L1/L2-centric mobility (Huawei)

[8] [R3-212511](file:///D:\Work\3GPP\RAN3\RAN3%23112e(202105)\Drafts\CB%20%23%203_L1-L2_Mobility\Docs\R3-212511.zip) [Draft] Reply LS on L1/L2-centric mobility (Huawei)

This e-mail discussion is divided into two phases:

* Phase I: View collection

Deadline: Friday, May 21st, 2021, 12:00 UTC.

* Phase II: TBD

# For the Chairman’s Notes

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# Discussions

## Answers to questions in RAN1 LS

In the RAN1 LS, the question with direct RAN3 impact is Q4, i.e.,

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| **Question 4**: In regard of CU-DU split, from RAN2/3 perspective, is there any difference between supporting intra-DU only and supporting inter- in addition to intra-DU, in terms of the following?   1. The associated RAN2 specification impact, 2. Applicable use cases (e.g. deployment scenarios), and 3. Network inter-operability (e.g. across different gNB vendors) |

The main intention of this question is to identify the difference between intra-DU and inter-DU, i.e.,

* The associated RAN2 specification impact

This needs RAN2 inputs

* The applicable use cases

The use case for intra-DU is clear, i.e., the serving PCell and non-serving cell(s) belong to the same gNB-DU. For inter-DU case, the serving PCell and non-serving cell(s) belong to different gNB-DUs. Except intra-CU/inter-DU, contributions [3][7] mentioned inter-CU case as well. In addition, contribution [5] indicates that regardless of the deployment scenarios, both the 1) inter-cell multi-TRP, and 2) L1/L2 based inter-cell change are in the scope of Rel-17 L1/L2-centric mobility topic.

* Network inter-operability

Contributions [2][3][5] indicate that the main inter-operability is resulted from inter-DU case, and it will result high complexity to align the configurations among gNB-DUs.

In order to answer RAN1’s question, the moderator proposed to give the following response:

**Potential Proposal 1: the following answer is provided in response to RAN1’s Question4:**

*In case of CU-DU split, the difference between supporting intra-DU only and supporting inter-DU in addition to intra-DU lies in:*

* *Applicable use case*

*For intra-DU, the serving PCell and non-serving cell(s) belong to the same gNB-DU. While for inter-DU case, both intra-CU/inter-DU and inter-CU are applicable. Regardless of applicable use cases, the L1/L2-centric mobility should take both 1) inter-cell multi-TRP and 2) L1/L2 based inter-cell change into account.*

* *Network inter-operability*

*RAN3 believes that with the serving/non-serving cell in the same gNB-DU, the intra-DU case does not require any special handling to address interoperability between vendors since it is primarily intended for intra-gNB-vendor use cases.*

**Q1: Please provide your view on the above Potential Proposal 1**

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| **Company** | **Comment** |
| Samsung | Agree |
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In addition to the above difference, contributions in this meeting also give some detailed analysis on the RAN3 impact based on companies’ initial understanding to RAN1 LS. Since this is the first time for RAN3 to discuss this topic, the moderator feels that it is premature to discuss the detailed impacts at this moment. However, some common difference can be identified in terms of the impacted interface, i.e.,

* Intra-DU case: the main impact is focused on F1 interface.
* Inter-DU case: the significant impact can be foreseen, which may include F1/E1/XnAP. Moreover, some companies raise the concerns on the benefit of such inter-DU inter-cell mobility, compared to the existing L3 mobility and enhancements in Rel.16 (e.g., CHO), since it may introduce the extra delays.

The above analysis also shows the important difference between intra-DU case and inter-DU case. The moderator feels that it may be better to indicate such information to RAN1/RAN2. Thus, the following potential proposal is given:

**Potential Proposal 2: in the reply LS, RAN3 can indicate the following difference between intra-DU and inter-DU:**

* *Compared to intra-DU case, the inter-DU case will introduce much more impacts to RAN3, which may cover F1/E1/XnAP since this requires the inter-DU coordination and UE context transfer via gNB-CU.*

**Q2: Please provide your view on the above Potential Proposal 2**

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| **Company** | **Comment** |
| Samsung | Agree |
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## RAN3 work related issues

The contributions in this meeting already identify that RAN3 impact is inevitable for FeMIMO WI regardless of whether focusing on intra-DU case only or also including inter-DU case. On the other hand, as indicated in [5], RAN3 has not officially allocated TUs for FeMIMO WI. Thus, how to proceed RAN3 work deserves some discussions.

* TU issue

In moderator’s understanding, if RAN3 work is held on due to TU issue, L1/L2-centric inter-cell mobility may not be supported in Rel-17 without RAN3 involvement in case of CU-DU split case. Thus, to make progress for FeMIMO, RAN3 may need discuss the way for this topic in case of no TU. Some possible solutions are in moderator’s mind:

* Option 1: RAN3 discussion is LS-triggered, i.e., RAN3 carries the discussion only when LSes from other WGs are received
* Option 2: discuss it in Section 31 (Corrections and Enhancements to Rel-17)
* Option 3: Add RAN3 TU in WID
* …
* RAN3 focus

According to analysis in contributions, intra-DU case introduces less impact to RAN3, compared to inter-DU case. Contributions [2][5][7] indicate that intra-DU can be the focus of Rel-17.

**Q3: Please provide your view on the following questions:**

1. *Which of the following options can be selected to solve the TU issue in RAN3 in order to complete L1/L2-centric inter-cell mobility feature in Rel17 FeMIMO WI?* 
   * *Option 1: RAN3 discussion is LS-triggered, i.e., RAN3 carries the discussion only when LSes from other WGs are received*
   * *Option 2: discuss it in Section 31 (Corrections and Enhancements to Rel-17)*
   * *Option 3: Add RAN3 TU in WID*
   * *…*
2. *Can RAN3 focus on intra-DU case in Rel-17?*

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| **Company** | **Comment** |
| Samsung | 1. Option 1 and option 2 2. RAN3 is focused on intra-DU case in Rel-17 |
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## Technical clarification

In this meeting, companies in RAN3 seem to not have clear understanding to L1/L2-centric inter-cell mobility, which is the similar situation in RAN2 based on the agreements in last RAN2 meeting. Contribution [5] gives one specific clarification w.r.t. “non-serving cell”, i.e.,

“***Proposal 4: RAN3 recommends that RAN1/RAN2 clarifies the different “stages” during L1/L2-centric mobility and terminology used regarding “non-serving cell” at each stage in the mobility scenarios (e.g., addition of non-serving cell, release of non-serving cell, change of a non-serving cell., change of serving cell, etc.).***”

The moderator feels that if we want to get the clarification from RAN1/RAN2, some specific questions should be given in order to get the clear answer. Inspired by the above proposal in [5], the moderator lists the following questions for clarification as an example:

1. What does “non-serving cell” mean?
2. What is the procedure of L1/L2-centric mobility?
3. …

**Q4: Please provide questions for clarification from RAN1/RAN2.** Some examples are given:

1. What does “non-serving cell” mean?
2. What is the procedure of L1/L2-centric mobility?

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| **Company** | **Comment** |
| Samsung | Agree the above two example questions |
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# Conclusion, Recommendations [if needed]

If needed

# References