3GPP TSG-RAN WG2 #116-e Tdoc R2-211xxxx

Electronic meeting, 1st – 12th November 2021

Agenda Item: 8.12.2.2

Source: Ericsson (Rapporteur)

Title: Report on discussion for LS on inter-gNB coordination

Document for: Discussion, Decision

# 1 Introduction

This document captures the summary for the following offline discussion related to LS RAN2 received from RAN3 on inter-gNB coordination:

* [AT116-e][113][RedCap] LS on inter-gNB coordination (Ericsson)

Scope: Draft a reply LS for [R2-2109342](http://www.3gpp.org/ftp/tsg_ran/WG2_RL2//TSGR2_116-e/Docs//R2-2109342.zip)

Intended outcome: Draft reply LS to RAN3

Initial deadline (for companies' feedback): Tuesday 2021-11-09 1200 UTC

Initial deadline (for draft reply LS in R2-2111349): Tuesday 2021-11-09 1800 UTC

The following has been captured in the chair notes regarding discussion on the LS from RAN3:

On coordination between gNBs supporting RedCap UEs

[R2-2111100](http://www.3gpp.org/ftp/tsg_ran/WG2_RL2//TSGR2_116-e/Docs//R2-2111100.zip) Discussion on the coordination between gNBs supporting RedCap UEs Ericsson discussion NR\_redcap-Core

Observation 1 RedCap UEs should not attempt to camp/access in legacy cells or be handed over to such cells.

Observation 2 A legacy gNB can not detect a RedCap UE via the (RedCap) UE radio capabilities.

Based on the discussion in the previous sections we propose the following:

Proposal 1 Observations 1 and 2 are to be captured in the reply LS to RAN3

- Huawei is ok with a reply LS along the lines suggested by Ericsson. Vivo as well. LGE as well.

* Continue the discussion on possible reply LS to RAN3 in offline 113

The document intends to collect company views on the replies to be provided to RAN3. After this discussion has concluded, a draft LS will be provided for approval or further discussion.

# 2 Draft replies to RAN3 LS

The first question in the RAN3 LS is about whether RedCap UEs should attempt to camp in cells which are served by legacy gNBs (e.g. Rel-16 gNBs) which do not support serving RedCap UEs. In rapporteur’s understanding, RAN3 has been discussing whether there is a barring indication for RedCap UEs or, alternatively, a field in broadcast SI which indicates cell support for RedCap UEs. A field indicating support (or similar information) could potentially be introduced to Xn signaling between gNBs. In such case, absence of such information would mean that the RedCap UE is barred from camping in those cells signalled over Xn.

RAN2 has made the following agreements relevant for this discussion:

RAN2#114:

Agreements:

* SIB1 (not MIB) indicates cell barring for 1 Rx branch and 2 Rx branches separately for RedCap UEs. Further details of the solution are FFS
* The cell barring for RedCap UE is per cell (not per PLMN)
* RedCap UE supports the Intra Frequency Reselection Indicator.

RAN2#115:

Agreements:

* Specify separate indications in SIB1 for barring RedCap UEs with 1 Rx chain and 2 Rx chains.
* Specify a RedCap specific IFRI in SIB1.

Agreements via email - from offline 104:

1. IFRI for RedCap UEs in SIB1 is common for UEs with 1 Rx or 2 Rx branches.
2. If RedCap-specific IFRI is absent from broadcast SI, the UE considers the cell does not support RedCap.

Based on the earlier RAN2 agreements, the RAN2 intention should be clear: RedCap UE should consider a cell barred when the gNB does not support serving RedCap UEs (e.g. absence of RedCap-specific IFRI) or if the gNB indicates the cell is barred for RedCap UE with 1 and/or 2 receiver chains. RAN3 question seems to be about the former case, e.g. when the gNB does not support serving RedCap UEs.

**From LS** [**R2-2109342**](http://www.3gpp.org/ftp/tsg_ran/WG2_RL2//TSGR2_116-e/Docs//R2-2109342.zip)**:**

1. RAN3’s question: Can RAN2 confirm that RedCap UEs should not attempt to camp/access in legacy cells or be handed over to such cells; if so, can RAN2 please explain how access control will work for legacy gNBs. This is related to one option considered in RAN3, where it is assumed that the broadcast in supporting cells would be designed to indicate support (or access allowed), and the presence (or contents) of such broadcast would be indicated at Xn level by the possible introduction of new information elements, rather than a barring indication as mentioned in the LS.

**Draft reply to Q1:**

*RAN2 can confirm that RedCap UEs should not attempt to camp/access in legacy cells or be handed over to such cells. Support for RedCap UEs in a cell is signalled by RedCap-specific indicators, e.g., RedCap-specific IFRI, in system information broadcast. Absence of RedCap-specific indicators would indicate that the cell does not support RedCap UEs.*

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| --- | --- | --- |
| **Company** | **Agree with draft reply?** | **Comments** |
| BT | Agree |  |
| Intel | Agree |  |
| Qualcomm | Agree with change | We’d like to suggest the following change to the first statement as follows:*RAN2 can confirm that RedCap UEs should not attempt to camp/access in legacy cells or be handed over to such cells in which they do not meet the capability requirements. Support for RedCap UEs in a cell is signalled by RedCap-specific indicators, e.g., RedCap-specific IFRI, in system information broadcast. Absence of RedCap-specific indicators would indicate that the cell does not support RedCap UEs.*We think this clarification is needed because so far there is no definitive agreement in RAN2 that a RedCap UE which can operate in a full spec-compliant manner in a legacy cell should be prohibited from camp/access in such a cell.  |
| OPPO | Agree |  |
| Huawei, HiSilicon | Agree | For QC’s comment, it has been confirmed online the case proposed by QC will not be discussed in this meeting. It should not impact the LS to RAN3. |
| LGE | Agree |  |
| CMCC | Agree |  |
| MediaTek | Agree |  |
| Futurewei | Agree | For Qualcomm’s comment, since a RedCap UE operates as a non-RedCap UE in the fallback operation, it is not affected by the draft reply. |
| Samsung | Yes |  |
| vivo | Agree | We agree with Qualcomm’s suggestion to make it clearer. As for a cell with narrow bandwidth which could be supported by RedCap UEs, e.g. <=20MHz, current specification/conclusion doesn’t preclude RedCap UEs to operate as non-RedCap UEs. |
| CATT | Agree |  |
| Nokia | Agree |  |
| Xiaomi | Agree |  |
| Spreadtrum | Agree | Agree with HW and no need to mention fallback operation in reply LS. |
| ZTE | Agree |  |
| Ericsson | Agree | We would also be fine with the draft reply without additionally mentioning anything – also we see it in the same way as Futurewei, the mentioned case can still be possible (and future discussion in RAN2 is expected in any case). |

**Summary for Q1:**

17 replies have beend provided where all companies agree with the proposed draft reply, one company suggest a change is needed to explicitly refer to a UE which cannot meet the capability requirements. One additional company supports this in their reply. Four companies say there is no need to mention this in the reply.

Rapporteur thinks the case QC brings up should be discussed further before we can say explicitly whether such behaviour is supported for example during a handover (where source cell considers the UE as RedCap UE). Therefore the draft reply for this case is not updated for now.

For the second question, RAN3 asks whether legacy gNB can detect through UE Radio Capabilities that it cannot serve the RedCap UE. A legacy gNB may not understand the new signaling introduced for RedCap UE in the UE capability signaling, therefore, in rapporteur’s understanding, it cannot be guaranteed a legacy gNB can detect it cannot serve the RedCap UE through the UE Radio Capabilities.

**From LS** [**R2-2109342**](http://www.3gpp.org/ftp/tsg_ran/WG2_RL2//TSGR2_116-e/Docs//R2-2109342.zip)**:**

1. Can RAN2 confirm whether a legacy gNB can detect via the (RedCap) UE Radio Capabilities (e.g. at Handover preparation) that it cannot configure or serve the RedCap UE? This is related to another option considered by RAN3 in which a Rel-17 gNB can perceive, e.g., the support or barring by a neighbour gNB cell of RedCap UE via the handover preparation failure with signalling a proper cause value at XnAP level.

**Draft reply to Q2:**

*RAN2 can confirm it is not possible for a legacy gNB to identify a RedCap UE via RedCap UE radio capabilities. A legacy gNB may not understand e.g. new values or fields introduced in the radio capability signalling for RedCap UEs.*

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| --- | --- | --- |
| **Company** | **Agree with draft reply?** | **Comments** |
| BT | Agree |  |
| Intel | Agree |  |
| Qualcomm | Agree with change | We would like to suggest adding the following to the reply:*RAN2 can confirm it is not possible for a legacy gNB to identify a RedCap UE via RedCap UE radio capabilities. A legacy gNB may not understand e.g. new values or fields introduced in the radio capability signalling for RedCap UEs. And even if they do, it may not be possible for the source node to understand that rejection is due to the UE being a RedCap UE.*This addition is to point out the fact that even if a gNB is able to understand some RedCap UE’s capability report, the issue still can’t be avoided. |
| OPPO | Agree |  |
| Huawei, HiSilicon | Agree | RAN3 also mentioned “This is related to another option considered by RAN3 in which a Rel-17 gNB can perceive, e.g., the support or barring by a neighbour gNB cell of RedCap UE via the handover preparation failure with signalling a proper cause value at XnAP level.” Maybe we should also mention that the “singalling new cause value” does not work for a legacy taget gNB, which cannot add any new cause. |
| LGE | Agree |  |
| CMCC | Agree  | Share similar view with Huawei, we could mention that legacy gNB couldn’t signal a proper cause value in the reply. |
| MediaTek | Agree |  |
| Futurewei | Agree |  |
| Samsung | Agree |  |
| vivo | Agree |  |
| CATT | Agree |  |
| Nokia | Agree |  |
| Xiaomi | Agree | Agree with HW that a legacy gNB couldn’t signal a new cause value.  |
| Spreadtrum | Agree |  |
| ZTE | Agree |  |
| Ericsson | Agree | We are OK to mention target gNB may not understand meaning of a new value |

**Summary for Q2:**

17 replies have beend provided where all companies agree with the proposed draft reply, one company suggest a change related to source gNB not possibly understanding the reason for rejection and four companies mention a new cause value is not understood by legacy target gNB.The draft reply for Q2 in the draft reply LS is updated accordingly.

# 3 Conclusion

Draft LS is available in R2-21xxxxxxx. Draft reply for Q1 is copied as presented above, while draft reply for Q2 is updated according to the discussion.