**3GPP T****SG-RAN WG3 Meeting #119bis-e** **R3-231870**

**Electronic Meeting, April 17th – 26th, 2023**

**Agenda item: 10.2.3**

**Source: Intel Corporation (moderator)**

**Title: Summary of offline discussion for CB: # SONMDT3\_RACH**

**Document for: Discussion**

# Introduction

This document contains the summary of offline discussion for the following CB:

**CB: # SONMDT3\_RACH**

**- Check RAN2 progress in** [**R3-231112**](Inbox\R3-231112.zip)**, check group understanding and reply LS to RAN2**

**- Discuss RACH report optimization (e.g, feature priority, RACH partition configuration, time stamp, NW controls UE)**

**- Details on RACH report retrieval, e.g, the presence of gNB-DU UE F1AP ID and Random access Indication?**

**- Capture agreements and open issues**

**- Provide TPs if agreeable**

(moderator - Intel)

Summary of offline disc [R3-231870](Inbox\R3-231870.zip)

For the first round, the deadline is Thursday, April 20th, 08:00 am UTC.

# For the Chairman’s Notes

# Discussion (1st round )

## LS from RAN2 on SN RA report entries [1]

RAN2 made the following agreements:

1: To have “a list of SN RA report entries as a single NR container (i.e. NR RA-ReportList)”.

And then, RAN2 discusses the following alternatives regarding how the UE includes the PSCell identities:

* **Alt 1: Includes unique PSCell identities, i.e. if a PSCell occurs more than once in NR *RA-ReportList*, it is recorded only once in the list of PSCell identities**
* **Alt 2: Includes the last PSCell identity (in NR *RA-ReportList*)**

All alternatives are feasible from RAN2 perspective.

RAN2 respectfully asks RAN3 to check alternatives above (Alt 1 and Alt 2) and provide feedbacks.

**Q1-A: Please provide your comments on the two alternatives above.**

|  |  |  |
| --- | --- | --- |
| **Company** | **Alt 1 or Alt 2** | **Comments** |
| Intel | Alt 1 | If Xn interface between the gNB of the last PSCell and the gNB of other PSCells is not available, Alt2 is not workable or needs more enhancements. |
|  |  |  |

**Q1-B: Reply LS to RAN2**

The reply LS will be discussed in 2nd round based on the comments received for Q1.

## RACH report optimization

The following parameters are proposed to be included in the RACH report:

* 1. Feature priorities
  2. RACH partition configuration
  3. Time between RACH access that led to the generation of a RACH Report and reporting of the RACH Report to the NG-RAN
  4. The network controls the UE to report RA information

**Q2: Please provide your comments on these parameters.**

|  |  |  |
| --- | --- | --- |
| **Company** | **a)-d)** | **Comments** |
| Intel | Yes for c) | a), b) are configured by network nodes which could be the same node the UE sends the RA report to. Even if not, a Retrieve UE Context-like procedure can be used to retrieve these configuration information from the old gNB. Besides, considering these additional parameters are optional for configuration optimization, it is still acceptable even if these information are not available or retrieval failure happens. So we think it’s not worthwhile to ask UE to report them through air interface.  c) can be used for gNB to identify the RACH partition configuration for a specific UE. |
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## RACH report retrieval

RAN3 agreed to support a network-based solution for RACH report retrieval over F1AP based on an indication from the gNB-DU to the gNB-CU of successful RACH procedures which are not known to the gNB-CU (e.g., when RACH is triggered due to beam failure recovery, no PUCCH resource available, UL sync issue). A new class-2 F1AP message (e.g., RACH INDICATION) is used to indicate certain RACH occurrence(s) from gNB-DU to gNB-CU.

In last meeting, the message structure for RACH INDICATION was discussed but no agreement due to the following issues:

Whether the gNB-DU UE F1AP ID and Random access Indication are needed?

The name of IEs?

The criticality of IEs in this new introduced message?

ASN.1 issue…

Here I copied the example TP from [12] as a starting point for the continuous discussion.

#### 9.2.1.x RACH INDICATION

This message is sent by the gNB-DU to inform the gNB-CU about one or more random access procedures performed at the gNB-DU.

Direction: gNB-DU ® gNB-CU.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| IE/Group Name | Presence | Range | IE type and reference | Semantics description | Criticality | Assigned Criticality |
| Message Type | M |  | 9.3.1.1 |  | YES | ignore |
| **RACH Indication List** |  | *1..<maxnoofRACHIndications>* |  |  | YES | ignore |
| >RACH Report List Item |  | *1* |  |  |  |  |
| >>gNB-CU UE F1AP ID | M |  | 9.3.1.4 |  | YES | ignore |
| >>gNB-DU UE F1AP ID | M |  | 9.3.1.5 |  |  |  |
| >>Random accessIndication | O |  | ENUMARATED (true, …) |  |  |  |

|  |  |
| --- | --- |
| Range bound | Explanation |
| maxnoofRACHIndications | Maximum number of RACH Indications. Value is FFS. |

**Q3-A: Please provide your comments on whether gNB-DU UE F1AP ID is needed.**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes or No** | **Comments** |
| Intel | Yes | Prefer to follow legacy, i.e. two UE IDs from both sides uniquely identify one UE. |
|  |  |  |

**Q3-B: Please provide your comments on whether Random access Indication is needed.**

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| --- | --- | --- |
| **Company** | **Yes or No** | **Comments** |
| Intel | No | This RACH INDICATION message is used to inform the gNB-CU about the occurrences of successful random access procedures in the gNB-DU, and thus no need for this duplicate IE. |
|  |  |  |

In [12], IEs in the message have criticality “ignore”, but some participants raised concerns on this. In case of “ignore”, even if the receiver cannot understand the IEs and just ignore them, the sender may wrongly assume that the receiver has correctly received the message and will trigger RACH report retrieval. So instead, criticality “reject” is suggested.

**Q3-C: Please provide your comments on the criticality of IEs in this new introduced message.**

|  |  |  |
| --- | --- | --- |
| **Company** | **ignore or reject** | **Comments** |
| Intel | reject | Comments as above. |
|  |  |  |

**Q3-D: TP to TS 38.473**

The corresponding TP will be discussed in 2nd round based on the comments received for Q3-A, B, C.

## Other issues

Some other issues are also raised for RACH Enhancements, e.g. naming of RACH report, RA-SDT…

**Q4: Please list any other issues you deem to be discussed under this topic and also provide your comments.**

|  |  |  |
| --- | --- | --- |
| **Company** | **Other issues** | **Comments** |
|  |  |  |
|  |  |  |

# Conclusion

# Reference

1. R3-231112/R2-2302066, Reply LS on RACH enhancement for R18 SONMDT, TSG RAN WG2
2. R3-231203, Discussion on SON for RACH, Samsung
3. R3-231300, (TP for SON BL CR for TS 38.473) RACH enhancements, Intel Corporation
4. R3-231341, RACH optimization enhancements, Qualcomm Incorporated
5. R3-231555, Discussion on RACH enhancement, CATT
6. R3-231586, RACH Optimization enhancement, Ericsson
7. R3-231587, Reply LS on RACH enhancement for R18 SONMDT, Ericsson
8. R3-231628, (TP for SON BL CR to TS 38.473) Further discussion on RACH optimisation, Nokia, Nokia Shanghai Bell
9. R3-231709, (TPs for SON BLCRs for TS 38.473 and TS 38.423) RACH enhancements, ZTE
10. R3-231740, (TPs for SON BLCRs for TS 38.300, TS 38.401, TS 38.423, TS 36.423, TS 38.473): Remaining issues for RACH optimisation, Huawei
11. R3-231741, [draft] Rely LS on RACH enhancement for R18 SONMDT, Huawei
12. R3-230930, (TP for SON BL CR to TS 38.473) TP for RACH optimisation, Nokia, Nokia Shanghai Bell, Ericsson, ZTE