3GPP TSG-RAN WG2 #113bis-e R2-2104536

Electronic meeting, April 12th – 20th 2021

Agenda Item: 8.13.2.2

Source: CATT

Title: Report of  [AT113b-e][802][NR/R17 SON/MDT] 2 step RA and other SON enhancements (CATT)

Document for: Discussion

# 1 Introduction

This document is for report of the discussions as planned in the following [1]

[AT113b-e][802][NR/R17 SON/MDT]  2 step RA and other SON enhancements (CATT)

-     Step 1: Collect the companies’ view on the proposals in R2-2103093. Deadline is 16:00 UTC 15/04/2021.

-     Step 2: Based on majority view provide the agreeable proposals

-     Step 3: Collect the companies’ view on the new proposals and goto Step 2 until 04:00 UTC Friday 16/04/2021.

-     Step 4: Providing final proposals for CB session. Note that in CB session there will not be technical discussion again. We try to directly agree the final proposals.

-     Step 5: drafting the LS to RAN3 based on the potential agreements from the final proposals…

      Intended outcome: Easily agreeable proposals and LS draft

      Deadline: Friday 16/04/2021

This document is organized as the following. The discussions are in section 2, and the summary and proposals are in section 3.

# 2 Discussion

Rapporteur encourages the participating delegates to provide their contact information in this table.

|  |  |
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## 2.1 2-step RA report enhancements

The following proposals are provided in [2].

* Fallback indication

**Proposal 1: The RA report includes an explicit indication that enables the network to know that the fallback from 2-step RA to 4-step RA was performed by the UE.**

* RA type indication

**Proposal 2: RA type is implicitly indicated by 2-step RA specific information, e.g. the measured RSRP of DL pathloss reference or PRACH resource information.**

* Switching information

**Proposal 3: Network knows implicitly whether switching from 2-step RA to 4-step RA is performed by UE due to reaching a configured MSGA transmission times.**

* DL beam quality

**Proposal 4: RAN2 already agreed “UE includes the measured RSRP of DL pathloss reference obtained just ‎before performing RACH ‎procedure in 2step RA report. FFS how to reduce the report ‎overhead.‎” With this agreement, RAN2 assumes it sufficient to address RAN3’s request on ‎indication of whether DL beam quality is above or below the msgA-RSRP-Threshold-r16 (per RA ‎procedure)‎, as the configured msgA-RSRP-Threshold-r16 is known by the network.**

* Reply RAN3 LS for 2-step RA

**Proposal 5: RAN2 to discuss and reply LS to R2-2008731.**

As these proposals seem to be agreeable to vast majority during email discussions, we can check if these are agreeable to all.

**[Step1-Q1] Are proposals 1-5 agreeable to you?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes or No** | **Comments if any proposal(s) not agreeable** |
| **CATT** | Yes | These are based on majority’s view, so we think they are agreeable. |
| Sharp | Yes |  |
| vivo | Yes in general, P5 with comments | We agree P5 would be sufficient to reply the RAN3 LS.  But we are wondering what this FFS is about (FFS how to reduce the report ‎overhead), typically the length of the bitstring is 7 bits. does this mean that we should restrict the length of the parameter to less than 7 bits via some more efficient signalling-design way? |
| ZTE | Yes and additional comment for P1 | For P1, it is suggested to indicate this fallback indication is included “per RA attempt” since based on input from companies, it is almost all companies agree this fallback indication shall be included per RA attempt. |
| Ericsson | No to P2 | We have strong concerns about P2 at the moment.  With the approach proposed in P2, the perRAInfoList will include both 4 step and 2-step attempts. So the question is how the network can distinguish whether a RA attempt within the perRaInfoList is 2-step or 4-step. Especially if P3 is agreed, it is not clear how the network would distinguish those attempts in case of switch.  To us it seems much clearer to have separate entries for 2-step and 4-step, i.e. separate perRaInfoList, since when the UE switches from 2-step to 4-step, it restarts from scratch with a new RA procedure, so it makes totally sense to us to have a separate perRaInfoList. Also this proposal would be perfectly compliant with P3, i.e. no need to have explicit indication for the switch.  Since this is more a stage-3 detail, we would prefer to further evaluate the signalling design and postpone the issue to next meeting. |
| NTTDOCOMO | Yes |  |
| Qualcomm | Yes. |  |
| Samsung | Yes except for P3,  need to further clarify | On P3, we need to further clarify:  how NW can identify whether to reach at configured MSGA transmission times?  To do that, if UE should report the configured MSGA tramsission time information, 1-bit explicit indicator would be efficient. |
| Intel | Yes (with comment on P1) | Ok to the suggestion from ZTE on P1 |
| Lenovo | Yes |  |
| Huawei | OK with 1 and 5  2,3,4 needs further work. | We think 2, 3, 4 as they are currently worded are not OK.  Agree with Ericsson on p2, it may be possible to provide a more explicit indication depending on the signalling design.  For 3 from NW optimisation point of view several vendors indicated this is useful information.  For 4, we agree with the first part (i.e. that we already agreed „UE includes the measured RSRP of DL pathloss reference obtained just ‎before performing RACH ‎procedure in 2step RA report“ but this is not sufficient for fully understanding DL issues as we have described in R2-2103732 |
| OPPO | Yes |  |
| CMCC | Yes, with comment on P2 | For P2, share the view with Ericsson and Huawei. |
| Nokia | P1, P4, P5 OK  P2, P3 Not OK | We are veru sceptical about indicating „implicit“ information in reporting since it can introduce errors and confusion. SInce RACH Report will contain information in 2-step and 4-step RACH procedures that can be CBRA or CFRA, explicit indcations can indicate possible changes in a certain RACH attempt in a non-ambiguous way. |
| Rakuten Mobile | Yes |  |
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## 2.2 Mobility history information enhancements

The following proposals are provided in [2].

* Structure of PSCell MHI

**Proposal 6: PSCell MHI should be nested within the PCell MHI.**

* Where to report PSCell related MHI

**Proposal 7: PSCell MHI is reported only to PCell.**

* Main content for PSCell MHI

**Proposal 8: At least introduce PSCell ID (may include CGI or frequency+PCI) and the time UE stayed in each PSCell into PSCell MHI.**

* Message used to convey PSCell MHI

**Proposal 9: *UEInformationResponse* message is enhanced to convey the PSCell MHI to the network.**

* Applicable scenarios

**Proposal 10: RAN2 to discuss whether to extend the scope of UE history enhancement scenario in the WID, and if yes whether all the MR-DC scenarios could be supported.**

As these proposals seem to be agreeable to majority during email discussions, we can check if these are agreeable to all.

**[Step1-Q2] Are proposals 6-10 agreeable to you?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes or No** | **Comments if any proposal(s) not agreeable** |
| **CATT** | Yes | These are based on majority’s view, so we think they are agreeable.  Note that for the discussions around P10 there have been R3 agreement that ‎“Enhancement of UE History Information for Secondary Node applies to all MR-DC scenario” and ‎‎“Enhancement of UE History Information for Secondary Node does not apply to LTE DC scenarios”. ‎ |
| Sharp | Yes |  |
| vivo | Yes for P6/8/9/10, P7 with comments | Our thinking is that Option 1 (PSCell MHI is reported to both PCell and PSCell) could support the independence of MHI report fetching for SN, and we’d still like to left the flexibility of choice to NW implementation (i.e., NW can decide whether SN shall directly request the report or not). So we prefer Option 1 over Option 2.  But we are also fine to go with Option 2 if this is the majority view. |
| ZTE | Yes for p6 and p7,  P8-p10 with comments | - P8 we think in the PSCell ID and timeSpent is sufficient for this release, since the PSCell MHI is nested with PCell, no further enhancements is needed, so “ at least” is no needed;  - P9: “Enhanced” could be misleading which seems to imply we will discuss procedure change to UE Information reporting, therefore its is suggested to use “used” to reply “enhanced”  - P10, we are fine to respect RAN3’s decision. |
| Ericsson | No to P7/P9 | We have strong concerns about P7/P9. We foresee the following issues:   * If the PCell does not support PSCell MHI retrieving, then all the SN MHI reports are lost even if the PSCell supports that. * Specificaiton impact is much larger compared with a solution in which the MHI goes also directly to the SN (e.g. in SRB1 via the Pcell, or SRB3). In particular, with P7, it will be needed to enhance the UEInformationRequest/Response. For example, the Request may need to be enhanced to include the info on whether the MN wants just MCG or SCG info. Especially, in case of EN-DC that might be problematic, since today there is no way to transfer directly NR-related MHI info to the LTE Pcell. The specification impact is much smaller if the MHI is transferred directly to the SN using the DL/ULInformationTrasnferMRDC (e.g. with SRB1 or SRB3). In that case, there is not even ASN.1 impact, we would just need to modify the field description of DL/ULInformationTrasnferMRDC. * With P7, the Xn interface is impacted and hence RAN3. While with the other approach there is no RAN3 impact.   Given the above, we would like to evaluate more carefully the specification impact of P7, and compare it with an approach in which the MHI is sent also to the SN just using the DL/ULInformationTrasnferMRDC. It seems that specification impact has not been evaluated so far in the discussions we have had. |
| NTTDOCOMO | With comment to P7/P9 | For P7, it is beneficial that SN MHI is to be reported to both MN and SN.  For P9, ULInformationTrasnferMRDC can enhanced to report SN MHI to SN. |
| Qualcomm | May be for P6, P7, P8, and P10  No for P9 | If the PSCell MHI is nested within Pcell MHI, UE is going to report the entire report to the network. It is up to the network, how it wants to use the Pcell and PSCell transition information. UEInformationResponse needs no enhancements.  Remark: we are against the whole PSCell information reporting from UE, as PSCell transition is only connected state information, it is already known to the network.  In the INACTIVE state, SCG configuration may be kept but there is no SCG cell UE is camped on. In IDLE state SCG is released. |
| Samsung | Not for P6 | We are still not convinced what is the use case of such correlation. We would like to take this opportunity to re-iterate our earlier comment that when UE history information for PCell was introduced, its purpose is for detecting handover ping-pong. For ping-pong purpose, PSCell MHI is enough. Also, our understanding is there are cases in RAN3 specification that PCell ID is not always to SN so SN has no mean to link it. Also there are cases in RAN3 specification that the MN doesn't know PSCell ID. It means that the current network signalling cannot support the linking. Thus, if the majority prefers to have such correlation, we suggest to send a LS to RAN3 whether it is beneficial before hastily agreeing on P6.  In addition, if we link PCell MHI and PSCell MHI, it may cause huge memory on a UE side i.e. the worst case will be 16\*16 big list. |
| Intel | Yes | For P10, we are fine with RAN3 decision, and therefore we could confirm this also in RAN2. |
| Lenovo | Yes, and | For P10, we prefer to extend the scope of UE history enhancement to any MR-DC scenario. |
| Huawei, HiSilicon | 6-9 OK  10 can be FFS | For proposal 8 we think the time without SCG should also be recorded but as the proposal is „at least“ this is OK for now.  Proposal 10 is clearly not something easily agreeable as the proposal is to discuss, and extending the WID scope is a matter for RAN. Although we think all the the scenarios could be supported we suggest to just say „FFS whether all the MR-DC scenarios could be supported“ because it may be something which comes for free. |
| OPPO | May be for P6, P7, P8, and P10  No for P9 | Agree with Qualcomm |
| CMCC | Yes |  |
| Nokia | P6: No  P7-9: yes  P10 see comment | P6: We think a second list is more logical and cover more cases. For example in case PCell are the small cells and PSCells the large cells for coverage.  P10: Only if time allows |
| Rakuten Mobile | Yes |  |
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## 2.3 RA report related enhancements

### 2.3.1 SgNB RACH report

The following are proposed in [2].

**Proposal 11: UE reports the SN RACH report to the MN, and then MN sends the SN RACH report to the SN.**

**Proposal 11.1: RAN2 to discuss and reply LS to R2-2008723.**

As these proposals seem to be agreeable to vast majority during email discussions, we can check if these are agreeable to all.

**[Step1-Q3] Are proposals 11 and 11.1 agreeable to you?**

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| --- | --- | --- |
| **Company** | **Yes or No** | **Comments if any proposal(s) not agreeable** |
| **CATT** | Yes | These are based on majority’s view, so we think they are agreeable.  We think R2 could leave detailed discussions to the future, and with this general agreement in P11 we could go on and reply to R3 LS. We see no strong reason to postpone so it’s better we can get this done at or after this meeting. |
| Sharp | Yes |  |
| vivo | See comments | As commented in Step1-Q2, the same logic applie here that we’d like to support the independent RACH report retrival procedure for SN.  But we are also fine to go with the majority view. |
| ZTE | In general fine, but suggest to use SgNB RACH report to align with terminology used in RAN3’s LS. | We are fine to kept the details open, but still, we prefer not to change NR RACH report procedure, i.e., no need to update NR RRC specs for this purpose. |
| Ericsson | No | Similar to our comment on P7/P9, we would like to evaluate more carefully the specification impact of P11, and compare it with an approach in which the MHI is sent also to the SN just using the field description updates of DL/ULInformationTrasnferMRDC. It seems that specification impact has not been evaluated so far in the discussions we have had. With the current proposal-11, one needs to make multiple changes to both NR and LTE RRC specification and include new octet string based report retrieval which is unnecessarily complex. |
| Qualcomm | Yes |  |
| Samsung | Yes |  |
| Intel | Yes |  |
| Lenovo | Yes |  |
| Huawei, HiSilicon | Yes | We may need email discussion to approve the LS. |
| OPPO | Yes |  |
| CMCC | Yes |  |
| Nokia | Yes | It seems more straightforward to report directly tot he MN and let MN send it tot he appriopriate SN |
| Rakuten Mobile | Yes |  |
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### 2.3.2 Other RACH Optimization

The following are proposed in [2].

**Proposal 12: The following RACH optimization can be further considered:**

a): UE also includes the PCell in the RA report in case the RA occurred in an SCell.

**[Step1-Q4] Is Proposal 12 agreeable to you?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes or No** | **Comments if any proposal(s) not agreeable** |
| **CATT** | No strong view. |  |
| Sharp | Yes |  |
| vivo | No strong view. |  |
| ZTE | Yes | We think this is useful since for RA initiated in SCell, UE will monitor the RARs in SpCells. |
| Ericsson | Yes |  |
| Qualcomm | No strong view. |  |
| Samsung | Yes | As a generic enhancement, we also suggest that the UE identifies the type of the cell such as PCell, SCell, and PSCell in which RA occurred. |
| Intel |  | Try to understand why the gNB cannot identify gNB/Scell based on scell ID and the frequency. And how can Pcell ID help. |
| Huawei, HiSilicom | Yes | There is a majority support for this so we are OK to go with that. |
| OPPO | No strong view |  |
| CMCC | Yes |  |
| Nokia | Yes |  |
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## 2.4 Other SON functions as proposed by companies

### 2.4.1 UL/DL coverage imbalance

The following are proposed in [2].

**Proposal 13: Introduce a list of CEF reports to identify and solve the problem about UL/DL coverage imbalance.**

**[Step1-Q5] Is Proposal 13 agreeable to you?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes or No** | **Comments if any proposal(s) not agreeable** |
| **CATT** | Yes |  |
| ZTE | Fine if it is majorities view. |  |
| Ericsson | Yes |  |
| Qualcomm | No | A list has a lot of memory requirements at the UE. We believe a simpler solution such as proposed by NOKIA should be adopted. |
| Samsung | No | For UL/DL coverage imbalance analysis, it seems better option to enhance RLF Report, rather than increasing the number of the CEF report  The motivation of the issue is to identify the UL/DL coverage imbalance. We have assumed that DL coverage is sufficiently identified based on current reported information. However, it is not sufficient to identify UL coverage with current reports. We may introduce one or two new indicators to represnet the UL coverage situation in RLF report. |
| Huawei, HiSilicon | Yes | Answer to Qualcomm: We can consider ways to limit the memory requirement. For example a prohibit timer for recording reports, or a limited number of reports. |
| CMCC | Yes | Agree with Huawei that we can further consider method to reduce the memory. |
| Nokia | No | The list may be helpful in terms of identification of DL availability. Each CE attempt informs that DL was measurable and UE tried to sync in UL, but failed because of UL issues. If however also the DL is fading away, the CE attempts will vanish and UE will even lose the RRC\_IDLE state. This information is not represented by the list of CEF, since without the CE attempt there will be also no CEF. Therefore, the information of DL availability can only be documented in the RLF report which was originally by UL coverage issue (expressed by failureType “maximum number of RLC retransmission reached”) Therefore, we are proposing in R2-2103552 that the UE can record explicitly the DL absence and to add this information about DL availability to the RLF report.  This single field can address the problem without introducing overcomplex handling of several CEFReports. The consequences of a CEFReports list (wich further contain a list of RACH reports) may lead to questionable usefulness of the feature. |
| Rakuten Mobile | Yes | We agree with Huawei, there ware ways to limit the memory requirments. |
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### 2.4.2 Enhancement related to MCG/SCG failure

#### **Issue 2.4.2-1 RLF triggered by MCG/SCG failure**

The following are proposed in [2].

**Proposal 14: Further discuss the motivation/purpose about enhance the RLF report for MCG/SCG failure for MDT or/and for SON.**

**[Step1-Q6] Is Proposal 14 agreeable to you?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes or No** | **Comments if any proposal(s) not agreeable** |
| **CATT** | Yes |  |
| Sharp | Yes |  |
| vivo | Yes |  |
| Ericsson | Yes |  |
| Samsung | No |  |
| Lenovo | Yes |  |
| Huawei | No | It can be postponed – „futher discuss“ isn‘t something valuable to agree in comeback session, of course we can further discuss. The intention of this email discussion is to formulate some agreeable proposals. |
| CMCC | Yes |  |
| Nokia | Maybe | In general, RLFreport is supposed to pass the information available from the time of failure either for MDT or/and for SON purposes. In both cases it is essential to understand motivation behing adding new information into the report. |
| Rakuten Mobile | Yes |  |
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#### **Issue 2.4.2-2 Enhancement for SN change failure**

The following are proposed in [2].

**Proposal 15: All the enhancement(s) content below should be introduced for SN change failure:**

1. **Introduce a new failure type of *reconfigureWithSyncFailurSCG* in *connectionFailureType*;**
2. **Include *perRAInfoList* field related to SCG failures in NR in a separate message, rather than the current SCG failure message;**
3. **Include *previousPSCellID*, *failedPSCellID*, *connectionFailureType* and *timeConnFailure* related to SCG failures in NR and EUTRA in a separate message, rather than the current SCG failure message.**

**[Step1-Q7] Is Proposal 15 agreeable to you?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes or No** | **Comments if any proposal(s) not agreeable** |
| **CATT** | Yes, and see comments | We are generally ok with P15. And it may be even better that we simply this proposal by just following the R3 LS in R3-211332(R2-2102639)‎. That way the proposal can be updated to  ‎  *All the following enhancements should be introduced for SN change failure:*  *RAN3 discussed the solution for the optimization of PScell change failure for MRO in case of MR-DC. RAN3 agreed it is beneficial for the NG-RAN node to receive the list of information as shown below for the purpose of PSCell failure analysis:*   1. *CGI of the Source PSCell: the source PSCell of the last SN change. The source PSCell could be E-UTRA cell or NR cell.* 2. *CGI of the Failed PSCell: the PSCell in which SCG failure is detected or the target PSCell of the failed PScell change. The Failed PSCell could be E-UTRA cell or NR cell.* 3. *timeSCGFailure: the time elapsed since the last PSCell change initialization until SCG failure.* 4. *connectionFailureType: radio link failure or SN change failure.*   *5) random-access related information set by the PSCell*  For the remaining details R2 can discuss in a later stage. |
| Sharp | Yes |  |
| vivo | Yes for b)c) | Not sure what the parameter *a) Introduce a new failure type* is used for? This seems not to be part of the parameters asked by RAN3 for further confirmation. |
| ZTE | No, it is too early to decide | How to report SN failure information have never been discussed before, and it is too early to agree on new message. We prefer to enhance the SCG failure information since there are already some information stored can be used to for optimize SN failure. And whether new parameters, e.g., connectionFailureType, is needed depends on if we will reuse SCG failure information. |
| Ericsson | Yes |  |
| NTTDOCOMO | Yes |  |
| Qualcomm | No | We should SCGFailureInformation for reporting this. |
| Samsung | Yes, but prefer to reuse current SCG failure message |  |
| Intel | No, too early | During email discussion, the majority view is to wait for RAN3. |
| Lenovo | Yes |  |
| Huawei, HiSilicon | No | Agree with Qualcomm. We prefer to reuse the SCGFailureInformation, if needed, with some enhancements - and would be easier just to refer to the RAN3 LS.  In R15 and R16, upon reception the SCGFailureInformation, the network can identify the issue and may optimise the related parameters by implementation. If a new message for the same purpose is introduced, it will be reported later than the SCGFailureInfo but with duplicated functionality and has unnecessary signalling overhead. |
| OPPO | No | Agree with Qualcomm |
| CMCC | Yes |  |
| Nokia | No | RAN3 LS R3-211332 should be the baseline |
| Rakuten Mobile | Yes |  |
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### 2.4.3 Fast MCG Recovery

The following are proposed in [2].

**Proposal 16: FFS whether to include fast MCG link recovery related information in RLF report.**

**[Step1-Q8] Is Proposal 16 agreeable to you?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes or No** | **Comments if any proposal(s) not agreeable** |
| **CATT** | Yes |  |
| Sharp | Yes |  |
| vivo | Yes |  |
| ZTE | Already can support | We to like to clarify that in R16 RLF report, we already support to store fast MCG recovery failure information in RLF report, so there is no need to discuss whether to include fast MCG recovery information in RLF report again. But we think some simple enhancements might be beneficial, which can be discussed based on contributions. |
| Ericsson | Yes |  |
| NTTDOCOMO | Yes |  |
| Qualcomm | Yes |  |
| Samsung | Yes |  |
| Lenovo | Yes |  |
| Huawei, HiSilicon | No | It is dependent on p14 – no point to discuss it now at this meeting. |
| OPPO | Yes |  |
| CMCC | Yes |  |
| Nokia | No | Fast MCG link recovery is out oft he scope of WID |
| Rakuten Mobile | Yes |  |
|  |  |  |

### 2.4.4 Other Optimizations

The following are proposed in [2].

**Proposal 17: It is confirmed that NR-U related enhancement should be discussed in Rel-17.**

**[Step1-Q9] Is Proposal 17 agreeable to you?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes or No** | **Comments if any proposal(s) not agreeable** |
| **CATT** | Yes |  |
| Sharp | Yes |  |
| vivo | Yes, but seems this proposal is not needed. | NR-U related enhancement should be discussed in Rel-17, as this is included/confirmed already in the latest WID RP-201281.   |  | | --- | | Depending on the progress of the work, the following objective may be discussed in the later part of the WI:   * NR-U related SON/MDT optimization which aims to reuse e.g. the existing NR-U measurements [RAN3, RAN2] |   But since this topic is a low priority WID objective, relevant issues may be discussed in the later part of the WI. |
| ZTE | Yes, and | It is already part of the scope, but discussion depends on progress on other objectives. |
| Ericsson | Yes |  |
| Qualcomm | Yes. |  |
| Samsung | Yes | RAN2 work on NR-U optimization will benefit commercial NR-U deployments. |
| Intel | Yes | It is already in the scope although with low priority. So it depends on the progress of other topics and RAN2 TU. |
| Lenovo | Yes |  |
| Huawei, HiSilicon | Yes, but | We can consider once more progress has been made on other higher priority aspects. |
| OPPO | Yes but | Agree with vivo |
| OPPO | Yes but | Agree with vivo |
| Nokia | Yes, but | If time allows and is based on companies inputs |
| Rakuten Mobile | Yes |  |
|  |  |  |

## 2.5 Step 2 discussion

### 2.5.1 2-step RA report enhancements

The discussions on the proposals are summarized in the following.

|  |  |  |
| --- | --- | --- |
| Proposal in step 1 | Summary of views | **Proposed conclusion for checking in step 2** |
| **Proposal 1: The RA report includes an explicit indication that enables the network to know that the fallback from 2-step RA to 4-step RA was performed by the UE.** | All the companies agree with P1, except for that two companies suggested to indicate this fallback indication is included “per RA attempt”. That seems agreeable.  So P1 is reworded for checking in step 2. | **Proposal 1A: The RA report includes an explicit indication per RA attempt that enables the network to know that the fallback from 2-step RA to 4-step RA was performed by the UE.** |
| **Proposal 2: RA type is implicitly indicated by 2-step RA specific information, e.g. the measured RSRP of DL pathloss reference or PRACH resource information.** | Out of the 15 companies, there are 4 companies not OK with P2. And among these 4 companies, 2 seem to have rather strong concern. Therefore Rapporteur suggests to keep this open for now. | **Proposal 2A: FFS whether RA type per RA procedure is known implicitly by NW or indicated explicitly in RA report.** |
| **Proposal 3: Network knows implicitly whether switching from 2-step RA to 4-step RA is performed by UE due to reaching a configured MSGA transmission times.** | Out of the 15 companies, there are 3 companies not OK with P3. Basically they think this kind of switching point information is useful to explicitly report to NW.  It seems this can be further discussed. | **Proposal 3A: FFS how network knows (i.e., explicitly or impliclty) whether ‎switching from 2-step RA to 4-step ‎RA is performed by UE due to ‎reaching a configured MSGA ‎transmission times.‎** |
| **Proposal 4: RAN2 already agreed “UE includes the measured RSRP of DL pathloss reference obtained just ‎before performing RACH ‎procedure in 2step RA report. FFS how to reduce the report ‎overhead.‎” With this agreement, RAN2 assumes it sufficient to address RAN3’s request on ‎indication of whether DL beam quality is above or below the msgA-RSRP-Threshold-r16 (per RA ‎procedure)‎, as the configured msgA-RSRP-Threshold-r16 is known by the network.** | Out of the 15 companies, only 1 companies think P4 not OK. Rapporteur understands there has been discussions on this particular issue. Based on the views, it is suggested to agree on P4 based on vast majority. | **Original P4 is kept.** |
| **Proposal 5: RAN2 to discuss and reply LS to R2-2008731.** | All companies are OK with P5. One companies proposed to refine the wording. This can be addressed after the online session, based on the agreements. | **Original P5 is kept.** |

Based on the summary above, the proposals are listed in the following. Companies are invited to share their comments if any.

**Proposal 1A: The RA report includes an explicit indication per RA attempt that enables the network to know that the fallback from 2-step RA to 4-step RA was performed by the UE.**

**Proposal 2A: FFS whether RA type ‎per RA procedure is known ‎implicitly by NW or indicated ‎explicitly in RA report.**

**Proposal 3A: FFS how network knows (i.e., explicitly or impliclty) whether ‎switching from 2-step RA to 4-step ‎RA is performed by UE due to ‎reaching a configured MSGA ‎transmission times.‎**

**Proposal 4: RAN2 already agreed “UE includes the measured RSRP of DL pathloss reference obtained just ‎before performing RACH ‎procedure in 2step RA report. FFS how to reduce the report ‎overhead.‎” With this agreement, RAN2 assumes it sufficient to address RAN3’s request on ‎indication of whether DL beam quality is above or below the msgA-RSRP-Threshold-r16 (per RA ‎procedure)‎, as the configured msgA-RSRP-Threshold-r16 is known by the network.**

**Proposal 5: RAN2 to discuss and ‎reply LS to R2-2008731. ‎**

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| **Company** | **Any proposals not agreeable?** | **Comments if any proposal(s) not agreeable** |
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### 2.5.2 Mobility history information enhancements

The discussions on the proposals are summarized in the following.

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| Proposal in step 1 | Summary of views | **Proposed conclusion for checking in step 2** |
| **Proposal 6: PSCell MHI should be nested within the PCell MHI.** | Out of 15 companies, 2 against P6, another 2 show reservation on it.  Among these companies there is one company think the whole PSCell information reporting from UE‎ is not needed, while one company believe we should first ask R3.  It seems easy agreement is not possible. But given the views so far at least vast majority would be OK to further study on the details. Therefore we put this aspect to FFS. | **Proposal 6A: FFS whether PSCell MHI is nested within the PCell MHI, or it is a separate report from PCell MHI.** |
| **Proposal 7: PSCell MHI is reported only to PCell.** | Out of 15 companies, 1 against P7, another 3 show reservation on it.  Among these companies one showed strong concern, and would like more evaluations, which seems fair request.  It seems easy agreement is not possible during this meeting. But given the views so far at least vast majority would be OK to further study on the details. Therefore we put this aspect to FFS. | **Proposal 7A: FFS whether PSCell MHI is reported only to PCell, or it can be reported to both both PCell and PSCell‎.** |
| **Proposal 8: At least introduce PSCell ID (may include CGI or frequency+PCI) and the time UE stayed in each PSCell into PSCell MHI.** | It seems no company oppose P8. Considering the comments, it seems we could update its wording. | **Proposal 8A: If PSCell MHI is introduced, at least include PSCell ID (may include CGI or frequency+PCI) and the time UE stayed in each PSCell into PSCell MHI.** |
| **Proposal 9: *UEInformationResponse* message is enhanced to convey the PSCell MHI to the network.** | Out of 15 companies, 3 against P9, another 2 show reservation on it.  It seems not posislbe to easily agree on this. But given the views so far at least vast majority would be OK to further study on the details. Therefore we put this aspect to FFS. | **Proposal 9A: FFS which message to to convey the PSCell MHI to the network.** |
| **Proposal 10: RAN2 to discuss whether to extend the scope of UE history enhancement scenario in the WID, and if yes whether all the MR-DC scenarios could be supported.** | Out of the 15 companies, 4 show reservation on it, one company propose to FFS. One company thinks this is R3 discussion but R2 can confirm as well.  Slight rewording is made. | **Proposal 10: FFS whether to extend the scope of UE history enhancement scenario in the WID, and if yes whether all the MR-DC scenarios could be supported.** |

Based on the summary above, the proposals are listed in the following. Companies are invited to share their comments if any.

**Proposal 6A: FFS whether PSCell MHI is nested within the PCell MHI, or it is a separate report from PCell MHI.**

**Proposal 7A: FFS whether PSCell MHI is reported only to PCell, or it can be reported to both both PCell and PSCell‎.**

**Proposal 8A: If PSCell MHI is introduced, at least include PSCell ID (may include CGI or frequency+PCI) and the time UE stayed in each PSCell into PSCell MHI.**

**Proposal 9A: FFS which message to ‎to convey the PSCell MHI to the ‎network.‎**

**Proposal 10A: FFS whether to extend ‎the scope of UE history ‎enhancement scenario in the WID, ‎and if yes whether all the MR-DC ‎scenarios could be supported.‎**

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| **Company** | **Any proposals not agreeable?** | **Comments if any proposal(s) not agreeable** |
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### 2.5.3 RA report related enhancements

**SgNB RACH report**

The discussions on the proposals are summarized in the following.

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| Proposal in step 1 | Summary of views | **Proposed conclusion for checking in step 2** |
| **Proposal 11: UE reports the SN RACH report to the MN, and then MN sends the SN RACH report to the SN.**  **Proposal 11.1: RAN2 to discuss and reply LS to R2-2008723.** | 14 companies shared their view, out of which only 1 company is against this.  The single company against this seems to have rather strong concern on spec complexity.  Give the vast majority’s view, Rapporteur suggests to progress on this, and leave detailed signalling for later discussions. | Proposal 11 and 11.1 are kept. |

Based on the summary above, the proposals are listed in the following. Companies are invited to share their comments if any.

**Proposal 11: UE reports the SN RACH report to the MN, and then MN sends the SN RACH report to the SN.**

**Proposal 11.1: RAN2 to discuss and reply LS to R2-2008723.**

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| **Company** | **Any proposals not agreeable?** | **Comments if any proposal(s) not agreeable** |
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**Other RACH Optimization**

The discussions on the proposals are summarized in the following.

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| Proposal in step 1 | Summary of views | **Proposed conclusion for checking in step 2** |
| **Proposal 12: The following RACH optimization can be further considered:**  a): UE also includes the PCell in the RA report in case the RA occurred in an SCell. | 12 companies shared their view, out of which 7 support, and 4 no strong view.  It seems possible to agree. | Proposal 12 is kept. |

Based on the summary above, the proposals are listed in the following. Companies are invited to share their comments if any.

**Proposal 12: The following RACH optimization can be further considered:**

a): UE also includes the PCell in the RA report in case the RA occurred in an SCell.

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| **Company** | **Any proposals not agreeable?** | **Comments if any proposal(s) not agreeable** |
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### 2.5.4 Other SON functions as proposed by companies

**UL/DL coverage imbalance**

The discussions on the proposals are summarized in the following.

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| Proposal in step 1 | Summary of views | **Proposed conclusion for checking in step 2** |
| **Proposal 13: Introduce a list of CEF reports to identify and solve the problem about UL/DL coverage imbalance.** | 9 companies shared their views, where 5 agree, 3 disagree, and 1 would be OK with majority.  It seems not possible for easy agreement. | **Proposal 13A: FFS how to identify and solve the problem about UL/DL coverage imbalance.** |

Based on the summary above, the proposals are listed in the following. Companies are invited to share their comments if any.

**Proposal 13A: FFS how to identify and solve the problem about UL/DL coverage imbalance.**

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| **Company** | **any proposals not agreeable?** | **Comments if any proposal(s) not agreeable** |
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**Enhancement related to MCG/SCG failure**

The discussions on the proposals are summarized in the following.

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| Proposal in step 1 | Summary of views | **Proposed conclusion for checking in step 2** |
| **Proposal 14: Further discuss the motivation/purpose about enhance the RLF report for MCG/SCG failure for MDT or/and for SON.** | 10 companies shared their view, where 2 companies disagree, 7 agree, and 1 no strong view.  As the proposal is anyway for further study. we could try to agree on it. | Original P14 is kept. |
| **Proposal 15: All the enhancement(s) content below should be introduced for SN change failure:**   1. **Introduce a new failure type of *reconfigureWithSyncFailurSCG* in *connectionFailureType*;** 2. **Include *perRAInfoList* field related to SCG failures in NR in a separate message, rather than the current SCG failure message;** 3. **Include *previousPSCellID*, *failedPSCellID*, *connectionFailureType* and *timeConnFailure* related to SCG failures in NR and EUTRA in a separate message, rather than the current SCG failure message.** | 15 companies shared their views, where 6 companeis think it too early to decide. Two companies think R3 LS in R3-211332(R2-2102639)‎ may serve as a baseline.  It seems not possible to easily agree on it. We could capture an FFS on this, based on R3 LS. | **Proposal 15A: FFS on enhancements for SN change failure, and request from R3 LS R2-2102639 is baseline for further discussions.** |

Based on the summary above, the proposals are listed in the following. Companies are invited to share their ‎comments if any.‎

**Proposal 14: Further discuss the motivation/purpose about enhance the RLF report for MCG/SCG failure for MDT or/and for SON.**

**Proposal 15A: FFS on enhancements for SN change failure, and request from R3 LS R2-2102639 is baseline for further discussions.**

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| **Company** | **any proposals not agreeable?** | **Comments if any proposal(s) not agreeable** |
| **Samsung** | P14 | We see no significant motivation on this enhancement.  Furthermore, some contents of RLF report would be overlapped with these of MCG or SCG failure information.  RAN3 has requested to discuss the issue of P15 while introducing clear motivation. RAN2 could first focus on it.  Thus, we would like to suggest to postpone P14 later. |
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**Fast MCG Recovery**

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| Proposal in step 1 | Summary of views | **Proposed conclusion for checking in step 2** |
| **Proposal 16: FFS whether to include fast MCG link recovery related information in RLF report.** | 14 companies shared their views, where 2 disagree, 1 thinks it already supported, 11 agree to FFS.  As the proposal is for FFS, so we could try to agree on it. | Original P16 is kept. |

Based on the summary above, the proposals are listed in the following. Companies are invited to share their ‎comments if any.‎

**Proposal 16: FFS whether to include fast MCG link recovery related information in RLF report.**

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| **Company** | **any proposals not agreeable?** | **Comments if any proposal(s) not agreeable** |
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**NR-U related enhancement**

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| Proposal in step 1 | Summary of views | **Proposed conclusion for checking in step 2** |
| **Proposal 17: It is confirmed that NR-U related enhancement should be discussed in Rel-17.** | 13 companies shared their views, and all agree on this. But it was pointed out that what this proposal had is already covered in the WID, and this view is supported by many.  So it seems we can drop this proposal without losing much information. | Original P17 is dropped. |

Proposals for checking in step 2, according the the summary above Based on the summary above, the proposals are listed in the following.

**No proposal is made on NR-U related enhancement.**

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| **Company** | **any proposals not agreeable?** | **Comments if any proposal(s) not agreeable** |
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# 3 Conclusion

The following are proposals based on the previous discussions.

*Note: if a proposal is numbered nA, it means it has been updated based on proposal n from email summary [2], otherwise it remains the same as in [2].*

**2-step RA report enhancements**

**Proposal 1A: The RA report includes an explicit indication per RA attempt that enables the network to know that the fallback from 2-step RA to 4-step RA was performed by the UE.**

**Proposal 2A: FFS whether RA type ‎per RA procedure is known ‎implicitly by NW or indicated ‎explicitly in RA report.**

**Proposal 3A: FFS how network knows (i.e., explicitly or impliclty) whether ‎switching from 2-step RA to 4-step ‎RA is performed by UE due to ‎reaching a configured MSGA ‎transmission times.‎**

**Proposal 4: RAN2 already agreed “UE includes the measured RSRP of DL pathloss reference obtained just ‎before performing RACH ‎procedure in 2step RA report. FFS how to reduce the report ‎overhead.‎” With this agreement, RAN2 assumes it sufficient to address RAN3’s request on ‎indication of whether DL beam quality is above or below the msgA-RSRP-Threshold-r16 (per RA ‎procedure)‎, as the configured msgA-RSRP-Threshold-r16 is known by the network.**

**Proposal 5: RAN2 to discuss and ‎reply LS to R2-2008731. ‎**

**Mobility history information enhancements**

**Proposal 6A: FFS whether PSCell MHI is nested within the PCell MHI, or it is a separate report from PCell MHI.**

**Proposal 7A: FFS whether PSCell MHI is reported only to PCell, or it can be reported to both both PCell and PSCell‎.**

**Proposal 8A: If PSCell MHI is introduced, at least include PSCell ID (may include CGI or frequency+PCI) and the time UE stayed in each PSCell into PSCell MHI.**

**Proposal 9A: FFS which message to ‎to convey the PSCell MHI to the ‎network.‎**

**Proposal 10A: FFS whether to extend ‎the scope of UE history ‎enhancement scenario in the WID, ‎and if yes whether all the MR-DC ‎scenarios could be supported.‎**

**SgNB RACH report**

**Proposal 11: UE reports the SN RACH report to the MN, and then MN sends the SN RACH report to the SN.**

**Proposal 11.1: RAN2 to discuss and reply LS to R2-2008723.**

**Other RACH Optimization**

**Proposal 12: The following RACH optimization can be further considered:**

a): UE also includes the PCell in the RA report in case the RA occurred in an SCell.

**UL/DL coverage imbalance**

**Proposal 13A: FFS how to identify and solve the problem about UL/DL coverage imbalance.**

**Enhancement for SN Change failure**

**Proposal 15A: FFS on enhancements for SN change failure, and request from R3 LS R2-2102639 is baseline for further discussions.**

**Fast MCG Recovery**

**Proposal 16: FFS whether to include fast MCG link recovery related information in RLF report.**

# 4 References

1. Draft session report SON/MDT, see https://www.3gpp.org/ftp/tsg\_ran/WG2\_RL2/TSGR2\_113bis-e/Inbox/Chairmans\_Notes
2. R2-2103093, ‎[Post113-e][852][NR R17 SON/MDT] 2 step RA and other SON ‎changes (CATT)‎
3. ‎[Draft] Reply LS on RACH report for 2-step RACH CATT LS out Rel-17‎ NR\_ENDC\_SON\_MDT\_enh-Core To:RAN3‎