3GPP TSG-RAN WG3 #113-e R3-214333

**E-meeting, 16th – 26th August 2021 Revise of R3-214170**

Source: CATT (moderator)

Title: CB: # SONMDT6\_RACHOpt

Agenda Item: 9.3.4.1

Document for: Approval

# Introduction

**CB: # SONMDT6\_RACHOpt**

**- Possible solution down selection?**

**- Neighbour PRACH configurations over F1AP? X2 impact?**

**- Maximum number of PRACH Configurations?**

**- UE RACH report for SN?**

**- PRACH configuration conflict resolved by changing beam sweeping configuration?**

**- Capture agreements and open issues**

**- Proceed to TPs if there are agreements.**

(CATT - moderator)

Summary of offline disc in [R3-214170](https://ericsson-my.sharepoint.com/personal/angelo_centonza_ericsson_com/Documents/Local%20Documents/3GPP_ETSI/RAN3/RAN3-113/EmailDiscussions/CB%20%23%20SONMDT6_RACHOpt/Inbox/R3-214170.zip)

The deadline for the first phase is 00:00 UTC on 20th August (Friday).

The deadline for the first phase is 00:00 UTC on 25th August (Wednesday).

# For the Chairman’s Notes

First round:

TP:R3-213218 agreed.

# Discussion (second phase)

After the online discussion, the moderator invites companies to confirm (and to reword if needed) 2 agreements and provide feedback over 2 new questions in the second phase.

## Confirming agreements

### Where to include PRACH configurations of neighbour cells

Considering that there is already an agreement achieved in RAN3 long before:

Include neighbor PRACH Configuration in GNB-CU CONFIGURATION UPDATE, GNB-DU CONFIGURATION UPDATE ACKNOWLEDGE messages

And considering the majority view in the first phase of discussion that we should not challenge this agreement as there is no very sufficient reason against it, the moderator propose to confirm this agreement this meeting.

**Questions X1-1**: Do you agree to confirm the agreement shown above?

| Company | Comment |
| --- | --- |
| CATT | Yes. |
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### What information to provide toward the gNB-DU

And in the first round all companies agree to follow the “Option 2” shown in Section 4.1.2, but there seems to be some divergence on how to capture this as an agreement, i.e. over wording.

In the second round it is proposed to be captured as following:

**The gNB-CU should be possible to provide the gNB-DU with information indicating the neighbouring relation of the cells served by this gNB-DU and their neighbour cells, along with the PRACH configurations of those neighbour cells, so as to prevent the gNB-DU from reconfiguring one of its cells from conflicting with one neighbour toward conflicting with another neighbour.**

Nevertheless, the moderator wants to point out that it is anyhow FFS over the set of “served cells” for which the neighbouring information and neighbouring PRACH configurations are provided, and whether we should put any restriction on it, e.g. containing all served cells, or only the ones encountering PRACH conflict, or leaving it up to the gNB-CU’s implementation.

**Questions X1-2**: Do you agree to capture the **bold text** above as agreement? And any suggestion on wording?

| Company | Comment |
| --- | --- |
| CATT | Yes.  We are also fine to capture the FFS below the bold text as open issue. |
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## New questions

### On cell list structure

On the basis of the agreement proposed to confirm in Section 3.1.2, the moderator proposes to discuss the structure of cell lists based on TPs provided by companies:

Assume that there are 5 cells, 2 served by the gNB-DU whereas the other 3 are neighbours:



Figure 1: One scenario of PRACH conflict.

And at one point of time the gNB-CU is to the delivery of neighbour’s PRACH configurations toward the gNB-DU.

The question is: how should the information structured?

One approach is like this (mainly in accordance with [9] but [1] and [10] are similar):

[Approach 1]

Neighbour item:  
>CGI: 21  
>Carrier list etc: XXX  
>PRACH Configuration: #1  
>Associated served cell list:  
>>CGI: 11  
Neighbour item:  
>CGI: 22  
>Carrier list etc: XXX  
>PRACH Configuration: #2  
>Associated served cell list:  
>>CGI: 11  
>>CGI: 12  
Neighbour item:  
>CGI: 23  
>Carrier list etc: XXX  
>PRACH Configuration: #3  
>Associated served cell list:  
>>CGI: 12

And another approach is like this (mainly in accordance with [8]):

[Approach 2]

Served cell item / served-cell-specific message:  
>CGI: 11  
>Neighbour list:  
>>Neighbour item:  
>>>CGI: 21  
>>>Carrier list etc: XXX  
>>>PRACH Configuration: #1  
>>Neighbour item:  
>>>CGI: 22  
>>>Carrier list etc: XXX  
>>>PRACH Configuration: #2  
Served cell item / served-cell-specific message:  
>CGI: 12  
>Neighbour list:  
>>Neighbour item:  
>>>CGI: 22  
>>>Carrier list etc: XXX  
>>>PRACH Configuration: #2  
>>Neighbour item:  
>>>CGI: 23  
>>>Carrier list etc: XXX  
>>>PRACH Configuration: #3

The moderator thinks that the two approaches provide equivalent information and are both suitable for the agreement proposed to confirm in Section 3.1.2, i.e. either can provide the “sufficient enough” information. The moderator invites companies to further evaluate these two approaches and provides preference accordingly.

**Questions X2-1**: Which approach is better in your opinion?

| Company | Comment |
| --- | --- |
| CATT | Approach 1.  Each block of the IEs highlighted in red costs much more bits compared with the IEs highlighted in blue. So we should avoid duplicating the red blocks as possible. |
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### On cell list maximum length

The final question, on the basis of both the discussion in Section 3.1.1 and Section 3.2.1, the moderator proposes to discuss the maximum length of cell lists.

Please note that there can be more than 1 level of cell list, depending on the answer in Section 3.1.1 and Section 3.2.1.

**Questions X2-2**: Is the compromised number i.e. 512 proposed by Rapporteur fine with you? What is your opinion on the maximum length for each level of cell list(s) in the approach you choose in Section 3.2.1?

| Company | Comment |
| --- | --- |
| CATT | We are OK with the proposal from Rapporteur to agree on a compromised number i.e.512.  As to the approaches in Section 3.2.1,we support approach 1.  The maximum length of the neighbour cell list (i.e. the first level) is proposed to be 512, following the same value used for the existing *Neighbour Cell Information List* IE in TS 38.473.  The maximum length of the “Associated Served Cell List” (i.e. the second level) is proposed to reuse the *maxnoofNeighbours* value, i.e. 1024, even though in practice it can never exceed 32 in our understanding. It is also acceptable for us to hard-code it as a “low number”, e.g. 32.  During the online session, there is concern on using a large number of neighbour cell list i.e.512 and the main concern is that it may exceed the allowed message size. However, in fact, during the Xn setup procedure, the maximum number of cells within one gNB is 16384 which is much larger than 512. We do not think 512 would be a problem. |
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# Discussion (first phase)

## PRACH Coordination

How to perform PRACH coordination in gNB-CU/DU split architecture (and for EN-DC as well maybe) is one open issue left over from Rel-16. This exhausting topic has cost us an additional whole year, but few agreements have ever been achieved.

So in this meeting, the moderator tries to align everybody’s understanding first, before going down to any details on TPs.

### When a PRACH conflict may occur

One of the most fundamental divergences on understanding comes from when a PRACH conflict may occur.

The most natural understanding is that PRACH conflicts occur only if two SSB areas of two cells spatially neighbours each other. This understanding is followed by some companies as of the raised discussion papers [1][8].

The moderator decides to name it as “Understanding 1” and to illustrate this case as following:



Figure 2: Understanding 1 of PRACH conflict.

In [8] it is further claimed that:

|  |
| --- |
| Even having beam relation information, it might not be straightforward to deduce whether a real PRACH conflict occurs as spatially neighbouring beams may not interfere due to different beam sweeping patterns in time domain. As exemplified in Figure 1, although SSB #1 of Cell-A is spatially neighbour to SSB #2 of Cell-B, RACH attempts do not collide even with the same RACH configurations, as the presence of SSB #1 of Cell A and SSB #2 of Cell B do not overlap at any time. |

And accordingly, a method to prevent PRACH conflict by changing the beam sweeping pattern is proposed in [7].

On the other side, one company shows some disagreement on that understanding, claiming that PRACH conflicts may occur not only in that very case [4]:

|  |
| --- |
| PRACH, as a physical channel, does not use any spatial domain multiplexing (SDM) at least from the perspective of specs. And using a much more “omnidirectional” mode (i.e. covering the entire cell) when receiving the random access preambles is a common implementation, with one reason that this is simple and another reason that multiple SSB areas may share the same RACH occasion, as indicated by the field *SSB per RACH Occasion*.  /////////////////////////////////////////////////////////////////////some words omitted/////////////////////////////////////////////////////////////////////  It will occur if one SSB area (of the aggressor cell) uses a PRACH resource which is the same as the one used in any SSB area of any cell (i.e. the victim cell) neighbouring the prior SSB area. |

The moderator decides to name it as “Understanding 2” and to illustrate this case as following:



Figure 3: Understanding 2 of PRACH conflict.

**Questions 1.1-1**: What is your understanding on when a PRACH conflict may occur, e.g. Understanding 1 or 2?

| Company | Comment |
| --- | --- |
| Ericsson | The correct description of how PRACH conflict is generated is better described by Understanding 1. We consider Understanding 2 as one possible network implementation, but definitively not the most common. If cells have a PRACH configuration per SSB and if SSBs “sweep”, then it is obvious that PRACH resources at the RAN will also “sweep”. The reason why this mechanism was introduced in 5G is to avoid interference by decoupling resources also at temporal level. It is however unclear how this question is relevant to the discussion.  [Moderator] Well, this question is a prerequisite of Q1.1-2, and maybe also related to how frequent PRACH conflicts may happen. |
| Huawei | We are not sure if changing of beam sweeping can solve the PRACH configuration conflict issue.  Because if the two neighbor cells use the same PRACH resources, conflict may occur within SSBs from two cells whose coverage are overlapped. |
| Nokia | Both understandings for PRACH conflict are possible, but in our view they would not create different solutions to PRACH conflict resolution. |
| ZTE | Understating 1 is common case, but understating 2 is also possible.  In addtion, it seems not possible to totally mitigate PRACH confilic with understanding 1. |
| Lenovo and Motorola Mobility | Both understating 1 and understating 2 are possible. |
| CATT | We think Understanding 2 is more suitable.  PRACH is carefully designed so that the NR node can get aware of the SSB area where the UE currently locates, by only the information of the selected RACH occasion and preamble (please see Section 8.1 of TS 38.213 for detail). That is to say, SDM is not used for PRACH and thus virtually omnidirectional antenna covering the entire cell is always applicable.  So we have to support Understanding 2 anyhow.  In addition, multiple SSB areas may share the same RACH occasion, as indicated by the field SSB per RACH Occasion. It is clearly specified in TS 38.331 (and copied to TS 38.473) that one RACH occasion can be shared by up to 16 SSB areas. For these cases PRACH is anyhow impossible to sweep over the space as SSB bursts do. As the result the following PRACH conflict may occur: |

**Moderator’s summary:** 6 companies provided feedback. 5 companies expressed that both cases of conflict are possible, whereas 1 company did not provide valid comment on this issue.

**Proposal: RAN3 is proposed to assume (i.e. working assumption) that, at least for some cases, a PRACH conflict may occur when the “aggressor” SSB area uses a PRACH resource which is the same as the one used in the “victim” SSB area of the “victim” cell which neighbours the prior SSB area, even if the “victim” SSB area itself does not border the “aggressor” SSB area.**

**Moderator’s suggestion:** The moderator thinks that it is not needed to discuss this topic in the second phase.

**Questions 1.1-2**: Do you agree to introduce the method to support indicating a change of the beam sweeping pattern from the gNB-DU toward the gNB-CU?

| Company | Comment |
| --- | --- |
| Ericsson | If the moderator refers to the methods proposed in [7], then the proposal is not to “requesting a neighbour cell to change the beam sweeping”. [7] states that a gNB-DU can, already today, decide to change its SSB sweeping patterns. One reason for that could be to resolve PRACH interference issues. The proposals in [7] are that if a gNB-DU changes its SSB sweep, then gNB-DU will notify gNB-CU, so that gNB-CU is aware of a change in neighbour relations due to such SSB sweep changes. The gNB-CU can rely on newly configured UE measurements to gather the new neighbour relations of the SSB beams for which the sweep pattern was changed.  We agree with this solution because it consists of the simplest way to resolve a PRACH conflict, i.e. such solution could be completely gNB-DU internal.  [Moderator] Yes, you are right. The description is updated. |
| Huawei | We don't think that telling the change of SSB sweeping pattern to CU is needed. The CU can do nothing with such information.  Neighbour relationship modification due to beam sweeping change shall be decided based on updated RRM measurements from the UE. |
| Nokia | No, we don’t see the need for such method. Beam sweeping patterns are part of implementation. Existence of conflicts in the beam sweeping patterns would mean that network planning is poor. |
| Samsung | Agree with Huawei and Nokia. |
| ZTE | Agree with HW, CU can do nothing with such information. |
| Lenovo and Motorola Mobility | Agree with HW that the usage of SSB sweeping pattern by the CU is not clear. |
| Qualcomm | Not needed |
| CATT | We believe that the gNB-DU can always change the SSB sweeping on itself.  But first, as explained in Q1.1-1, the time-spatial sweeping pattern of PRACH is often different from the time-spatial sweeping pattern of SSB bursts. Which sweeping is meant in [7] is not clear.  Second, we don’t see the benefit to provide this toward the gNB-CU. We have agreed that PRACH conflict is to be solved in the gNB-DU. What the gNB-CU can do after receiving such information is not clear.  So we cannot agree with the proposal in [7] at present. |

**Moderator’s summary:** 8 companies provided feedback. 7 companies showed negative opinion over this proposal, while 1 company showed support.

**Moderator’s suggestion:** It is open whether to indicate a change of the beam sweeping pattern from the gNB-DU toward the gNB-CU.

### How should the gNB-CU perform filtering

In previous meetings we have already agreed that the gNB-CU should perform some filtering before sending toward the gNB-DU about the PRACH configurations of neighbouring nodes. But there may be some divergence of view on the detail level.

One understanding is that the gNB-CU should forward only the PRACH configuration currently in conflict:

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| --- |
| The list of neighbour PRACH configurations the gNB-CU signals to the gNB-DU consists of a filtered set of PRACH configurations, i.e. the PRACH configurations of the cells neighbouring the cell in conflict. |

Whereas some other companies think that the gNB-CU should forward not only the PRACH configuration currently in conflict, but also the PRACH configuration which may potentially in conflict [1][4]:

|  |
| --- |
| The gNB-DU needs to know enough neighbour cell’s PRACH configurators in order to effectively choose a new PRACH configuration for the cell in conflict. |

The moderator’s understanding is that, assume that there are one cell (let it be Cell A) using PRACH configuration #1 and two neighbour cell Cell B and Cell C using PRACH configuration #1 and #2 respectively:

* Current cell of gNB-DU: Cell A; PRACH #1;
* Neighbour cell: Cell B; PRACH #1;
* Neighbour cell: Cell C; PRACH #2;

And the two options can be described as:

* Option 1: To deliver only “Neighbour cell: Cell B; PRACH #1” toward that gNB-DU.
* Option 2: To deliver both, in order to prevent the gNB-DU from reconfiguring Cell A from PRACH #1 to #2.

**Questions 1.2-1**: Which method do you prefer? Or both methods should be supported?

| Company | Comment |
| --- | --- |
| Ericsson | Again, there seem to be a misunderstanding about the proposal in [8].  The text quoted by the moderator says:  *The list of neighbour PRACH configurations the gNB-CU signals to the gNB-DU consists of a filtered set of PRACH configurations, i.e. the PRACH configurations of the cells* ***neighbouring*** *the cell in conflict.*  The above text is written in British English and it might be less intelligible than others, but what it means is that the gNB-CU will report to the gNB-DU the PRACH configurations of all the cells that are neighbour of the cell in conflict. With reference to the example proposed above, the proposal in [8] is to report both PRACH configurations of Cell B and Cell C, namely Option 2.  We support Option 2.  [Moderator] Thank you for your clarification, but we decided to keep Option 1 as it is except removing the reference of [8]. |
| Huawei | Option2.  Don’t see any necessity to filter at the CU. It doesn’t make sense. It is up to CU implementation. |
| Nokia | We support Option 2. |
| Samsung | Option 2 |
| ZTE | We support Option 2 |
| Lenovo and Motorola Mobility | Option 2, it can avoid the PRACH reconfiguration which would cause a new PRACH conflict. |
| Qualcomm | Option 2. |
| CATT | Option 2. |

**Moderator’s summary:** 8 companies provided feedback and all supported Option 2.

**Proposal: RAN3 is proposed to agree that, the gNB-CU should forward toward the gNB-DU with a sufficient enough sets of neighbour PRACH configurations, so as to prevent the gNB-DU from reconfiguring its cell from conflicting with one neighbour toward conflicting with another neighbour.**

### Whether to include some assistance info, and what to include

In addition, some companies propose to introduce some assistance info.

One company in [1] proposes:

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| --- |
| It is also likely that the gNB-CU does not send enough neighbour cells’ PRACH configurations by implementation. From this perspective, the request from DU seems needed. |

That is to say, a gNB-DU should be possible to “pull” PRACH configuration from the gNB-CU, in addition to the “push” method. It is further shown in the TP as to introduce a simple “ENUMERATED (yes, ...)” indicator directly in the message level, without providing any further information.

**Questions 1.3-1**: Do you agree to introduce the method to support that a gNB-DU can retrieve from the gNB-CU of the PRACH configuration of neighbour cells?

| Company | Comment |
| --- | --- |
| Ericsson | Yes, we support this proposal. This would greatly help the problem of signalling excessive amount of neighbour PRACH configurations. Namely, the gNB-CU could first signal to the gNB-DU a first list of PRACH configurations for the cells that are the closest neighbours of the cell in conflict. If this is sufficient, the gNB-DU may be able to fix the PRACH conflict and no more PRACH degradation is monitored. If this is not sufficient (i.e. there is a conflict with some other, unknown, neighbour) then the gNB-DU may request to the gNB-CU more neighbour PRACH configurations.  With respect to the proposal in [1], we would however propose that a gNB-DU signals to the gNB-CU a request for neighbour PRACH configurations together with the CGI or the cell for which neighbour PRACH configurations want to be received. Namely, the information signalled by the gNB-DU should be:   * CGI of cell in PRACH conflict * List of PRACH configurations for cells neighbouring the cell in conflict |
| Huawei | As a compromise, we accept to have the pull function as a backup if max 512 neighbour cells’ PRACH configurations are transferred to the DU.  Again, we still think that PRACH configuration conflict can be solved by the DU locally with the information received from CU during F1 SETUP response and configuration update messages. |
| Nokia | No, we do not think that such signaling is needed. If a possibly large maximum number (512) of PRACH configurations can be sent from CU to DU, then DU does not need to request for further PRACH Configurations from its CU. |
| Samsung | No. It's not mandated to transfer all neighbour PRACH configurations to DU from CU. So a large maximum number is enough. |
| Lenovo and Motorola Mobility | Agree with Nokia. |
| Qualcomm | No strong opinion. The compromise proposed by Huawei is also fine; but then the purpose of pull function seems void. |
| CATT | We are neutral over this issue. |

**Moderator’s summary:** 7 companies provided feedback. 3 disagreed, 1 supported, and the other 3 were neutral.

**Moderator’s suggestion:** It is open whether to introduce the method to support that a gNB-DU can retrieve from the gNB-CU of the PRACH configuration of neighbour cells.

Whereas another company proposes that the gNB-CU may provide some additional assistance info toward the gNB-DU [5]:

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| --- |
| Additional assistance information from gNB-CU to gNB-DU looks beneficial. Exact content of assistance information needs further discussion, but more or less detailed information (not just binary indication) should be beneficial to detecting exact PRACH conflict situation and to guide gNB-DU actions for PRACH conflict resolution. |

**Questions 1.3-2**: Whether some additional assistance info should be possible to be provide from the gNB-CU toward the gNB-DU? If so, what to provide?

| Company | Comment |
| --- | --- |
| Ericsson | In our view assistance information from gNB-CU to gNB-DU and a request form gNB-DU to gNB-CU for further neighbour PRACH configurations could co-exist in the same solution.  With respect to the assistance information from the gNB-CU to the gNB-DU, we believe that the gNB-CU should provide the CGI of the cell believed to be in PRACH conflict, as well as the PRACH configurations of the cells neighbouring such cell in conflict |
| Huawei | NO, we don't see any additional assistance information is needed. |
| Nokia | We think that CU should be able to provide DU with more than just a binary indication that characterizes conflict (coming from a neighbouring DU). In this way, the amount of conflict could give further information and flexibility about how to resolve it e.g., more serious conflicts are addressed first. Furthermore, a binary indication would be up to implementation in the sense that it will be up to each DU to tell a CU it is in conflict while different DUs might have different understandings of what a conflict is.  In order to support progress to have some functional solution at this point, we are also fine with the simple PUSH method where CU just forwards a DU a possibly large number of neighbour PRACH Configurations |
| Samsung | Agree with Huawei |
| ZTE | Additional assistance information is not needed in Rel-16. |
| Lenovo and Motorola Mobility | No |
| Qualcomm | If gNB-CU is providing “assistance” information in the form of the CGI of the cell in conflict and the PRACH configuration neighboring to the cell in conflict, isn’t PRACH conflict detection being done at gNB-CU? (against our stage-2 description).  So, either we change stage-2 to reflect that PRACH conflict detection is done at gNB-CU whereas PRACH conflict resolution is done at gNB-DU OR we have no assistance information from gNB-CU which just provides a filtered list of neighbor PRACH configurations “blindly”. |
| CATT | The proposal in [5] is not clear. We need some further information before answering yes or no. |

**Moderator’s summary:** 8 companies provided feedback. 4 disagreed, 2 supported, and the other 2 expressed some doubt on its intention.

**Moderator’s suggestion:** It is open whether some additional assistance info should be possible to be provided from the gNB-CU toward the gNB-DU.

### Where to include PRACH configurations of neighbour cells

The next question is on the high-level signalling design: In which F1AP message to include the PRACH configurations of neighbour cells?

Some companies show their preference to include it into all of the DL F1AP common messages: F1 SETUP RESPONSE, GNB-DU CONFIGURATION UPDATE ACKNOWLEDGE, and GNB-CU CONFIGURATION UPDATE [1][4][6].

Whereas another company propose to introduce a new procedure dedicated for this task [8].

**Questions 1.4-1**: What message to include the PRACH configuration of neighbour cells?

| Company | Comment |
| --- | --- |
| Ericsson | We would like to firs to comment that we do not support including RAHC conflict information in the F1 Setup Response. This is because there is no knowledge of neighbour relations at the time of F1 Setup. Also, the F1 Setup Response contains already many essential information. Including PRACH conflict information would increase the risk of a message oversize and of possible errors, preventing the F1 interface to be setup.  We propose in [8] a new procedure in order to maintain the F1 interface design modular. The gNB-CU/DU Configuration Updates are already full of a lot of information related to the DU/CU configuration. PRACH conflict information is not related to the CU or DU configuration and it is instead information used to fix an issue, the PRACH conflict. For this reason, a new procedure seems the most appropriate choice. Besides, it is easier to debug problems related to the PRACH conflict resolution function if a dedicated procedure is used, as well as improving the procedure without impacting CU/DU configuration transfer procedures. |
| Huawei | We don't see the strong motivation to have a new procedure. But we would like to clarify on following questions to better understand how this new procedure would work in the whole function.  If we use a new procedure, when and based on what trigger condition this procedure will be initiated by the CU?  What happens if the CU does not trigger this procedure while PRACH configuration is detected by the DU? |
| Nokia | We support to include PRACH Configuration of neighbour cells to all F1 SETUP RESPONSE, GNB-DU CONFIGURATION UPDATE ACKNOWLEDGE, and GNB-CU CONFIGURATION UPDATE messages. We don’t see the need for a new procedure. Regarding the F1 SETUP RESPONSE which has been a controversial option at the moment, we believe that if supported it can help the CU not to trigger additional GNB-CU CONFIGURATION UPDATE to send the PRACH Configurations in case neighbour information exists in the CU at the time of F1 Setup. This is because according to TS 38.473 the gNB-DU is required to activate its cells after completion of the F1 Setup procedure without any need to wait for a potential additional procedure triggered by the gNB-CU: “The gNB-DU shall activate the cells included in the Cells to be Activated List IE and reconfigure the physical cell identity for cells for which the NR PCI IE is included.”. So, in our view, the cells should be activated using the best possible PRACH configurations, and this is missing in "status quo". |
| Samsung | We don't see the benefit to introduce a new procedure. We prefer to reuse the legacy messages |
| ZTE | We don’t see the benefit to introduce New procedure in Rel-16. Prefer to use legacy message. |
| Lenovo and Motorola Mobility | Reuse the existing F1AP messages including F1 SETUP RESPONSE, GNB-DU CONFIGURATION UPDATE ACKNOWLEDGE and GNB-CU CONFIGURATION UPDATE. |
| Qualcomm | Reuse existing procedures. We can at least agree on GNB-DU CONFIGURATION UPDATE ACKNOWLEDGE and GNB-CU CONFIGURATION UPDATE. |
| CATT | We are neutral over this issue.  But, well, for the sentence “PRACH conflict information is not related to the CU or DU configuration and it is instead information used to fix an issue, the PRACH conflict”, unfortunately we have already includes some information used to fix an issue into the gNB-CU Configuration Update message i.e. TDD pattern conflict.  Nevertheless that is an annoying IE, we admit. |

**Moderator’s summary:** 8 companies provided feedback. 5 preferred reusing existing F1AP non-UE associated messages (detail FFS), 1 preferred new EP, and 2 were neutral.

**Moderator’s suggestion:** Since it is already agreed that “Include neighbor PRACH Configuration in GNB-CU CONFIGURATION UPDATE, GNB-DU CONFIGURATION UPDATE ACKNOWLEDGE messages”, no need to change the agreement without sufficient reason.

### A small mirror Stage 2 change

The last issue regarding PRACH coordination is a small mirror Stage 2 change on TS 38.401 proposed in [2]:

|  |
| --- |
| In case of split gNB architecture, RACH configuration conflict detection and resolution function is located at the gNB-DU. To perform RACH optimisation at gNB-DU, gNB-CU sends the RACH report reported by the UE to gNB-DU via F1AP signalling. The gNB-DU signals the PRACH configuration per-cell to gNB-CU. The gNB-CU may forward a limited set of neighbour cell’s PRACH configurations received from neighbour gNBs and other gNB-DUs to the gNB-DU to resolve the configuration conflict. |

**Questions 1.5-1**: Do you agree with the Stage 2 change shown above?

| Company | Comment |
| --- | --- |
| Ericsson | The proposal is fine for us |
| Huawei | agree |
| Nokia | TP is OK. |
| Samsung | Ok for us |
| ZTE | Agree |
| Lenovo and Motorola Mobility | Agree |
| Qualcomm | Agree |
| CATT | Yes. |

**Moderator’s summary:** 8 companies provided feedback and all agreed.

**Proposal: RAN3 is proposed to agree with the TP in [2].**

## Forwarding SCG RA Report

One company mentions an issue regarding RA Report forwarding for the case of Dual Connectivity [3], claiming that:

Considering the (Master) Node which receives the RA Report may be different from the Master Node when the concerned RA procedure occurs, the former (Master) Node should know what the latter Master Node is so that it can forward the RA Report firstly toward that node, or otherwise the RA Report may not be delivered to the correct Secondary Node.

**Questions 2-1**: Do you agree that the (Master) Node which receives the RA Report should know what Master Node the UE is connected to when the concerned RA procedure occurs?

| Company | Comment |
| --- | --- |
| Ericsson | A similar discussion seems to be ongoing in RAN2. We would like to postpone this discussion in RAN3 until RAN2 discusses and draws (at least) first conclusions. |
| Nokia | We should wait for RAN2 to conclude on this issue before we consider this. |
| Samsung | Agree with Ericsson and Nokia |
| ZTE | Pending to RAN2 progress. |
| CATT | We think for most cases the RA report can be forwarded toward the correct node. This is already sufficient enough to perform SON so no need to acquire every RA report. |

**Moderator’s summary:** 5 companies provided feedback. 4 preferred waiting for RAN2, 1 was negative on its proposal.

**Moderator’s suggestion:** Wait for RAN2 on whether the (Master) Node which receives the RA Report should know what Master Node the UE is connected to when the concerned RA procedure occurs.

# Conclusion, recommendations [if needed]

# Reference

[1] R3-213217; (TP for SON BL CR for TS 38.473): Left overs on RACH Optimization Enhancements; Huawei.

[2] R3-213218; (TP for SON BL CR for TS 38.401):Stage 2 update for RACH Optimization; Huawei.

[3] R3-213219; UE RACH report for SN; Huawei.

[4] R3-213507; Discussion on Rel-16 leftover issues for PRACH coordination; CATT.

[5] R3-213662; PRACH conflict detection and resolution; NEC.

[6] R3-213689; Down-selection and open point for RACH optimization; Nokia, Nokia Shanghai Bell.

[7] R3-213818; Signaling solution for Beam Sweeping Reconfiguration from gNB-DU to the gNB-CU; Ericsson.

[8] R3-213819; (TP for SON BL CR for TS38.473) RACH conflict resolution and RACH report availability indication over F1 interface; Ericsson.

[9] R3-213508; (TP on SON for 38.473) TP on PRACH coordination for F1AP; CATT.

[10] R3-213690; (TP for SON BL CR for TS 38.473) Enhancement of RACH Conflict Resolution; Nokia, Nokia Shanghai Bell.