3GPP TSG-RAN WG2 #114-e electronic R2-210xxxx

Electronic Meeting, 19th – 27th May, 2021

Agenda Item: 8.2.1

Source: Huawei

Title: [AT114-e][230][R17 DCCA] Making progress (Huawei)

Document for: Report and Decision

# 1 Introduction

This contribution is a summary for the following discussion:

**[AT114-e][230][R17 DCCA] SCG deactivation post-meeting email discussion scope (Huawei)**

Scope:

* + - Discuss what to incorporate in the post-meeting email discussion on SCG (de)activation

      Intended outcome:

* + - Discussion summary in [R2-2106505](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_114-e/Docs/R2-2106502.zip) (by email rapporteur).

      Deadline for providing comments, for rapporteur inputs, conclusions and CR finalization:

* + - Initial deadline (for company feedback):  2nd week Wed, UTC 1000
    - Initial deadline (for rapporteur summary):  2nd week Thu, UTC 0400

Contact person for each participating company:

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# 2 Discussion

## 2.1 UE behaviour upon SCG activation indication

Two options were considered for UE behaviour upon SCG activation indication:

1. Initiate RACH and then resume L1/L2 activities

2. Directly start all L1/L2 activities (listen to PDCCH, transmit SR/BSR, etc.)

Option 1 is anyway required to be supported (e.g. because RACH is needed if TA is not valid.

Option 2 was already largely debated and there is interest by may companies for it but views are highly split on the technical details so that no agreement could be made on any of the details.

The intention of the post-meeting email discussion is to prepare for agreements on option 2 at the next meeting. The rapporteur proposes further that, **if no agreement can be made at the next meeting on option 2 details, option 2 is deprioritised**, as there will not be sufficient time.

The rapporteur has suggested, as a possible progress, to agree either of the two following alternatives:

a) upon reception of the activation indication without reconfigurationWithSyncwhile TA timer is running, the UE decides whether to resume L1/L2 operation without RACH

b) the UE shall resume L1/L2 operation without RACH if instructed to do so in the activation indication

One company commented that both options are not mutually exclusive and the UE could choose. The rapporteur's understanding is that if the UE can chose, it is option a.

Both options could mean that both options are specified and the network configures he option to be used, or the indication says which option applies. Of course, specifying both options is more work so the need for that should be justified.

**Q1: Do you agree that if there is no progress on option 2 at the next meeting, it is deprioritised?**

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| --- | --- | --- |
| Company | Yes/No | Comments |
| Huawei | Yes | Otherwise, there is too much risk that RAN2 cannot complete "efficient SCG activation/deactivation" in R17. |
| Apple | No | We think companies have a bit of converging view. And we think both option 1 and 2 are valid.  Option 2b (if the NW says the UE can skip RACH) is a very practical use-case for small cells, where the NW ‘knows’ that UE’s TA does not change (due to small size of the cell) and can ask the UE to just resume.  We should not deprioritize op2 because of this.  Our proposal is to **atleast Op2-b** that “if NW configures the UE to skip RACH, the UE should skip RACH”.  Option 2a would be then the general case.  We think we can agree to an approach where the NW can ask the UE to skip RACH, and UE can decide. The discussion would then be on what criteria.  We are optimistic that this can be resolved.  But excluding op2 means that we are taking away from the table the option of faster re-activation of SCG. And in such a case, the UE can simply ‘shut-off’ SCG, and just do RRM using MCG :-)…! |
| Futurewei | Yes, but | Of cause, if we cannot make any agreement on option 2, existing random access upon activation is the baseline. The only possible enhancement on option 1 would be pre-allocating dedicated resources for deactivated SCG for CFRA. However, we have concern on that it could lock the precious resources for long time before the SCG activation. As a result, it could compromise the overall mobility performance. Therefore, we would suggest to keep option 1 without any further enhancement (no additional efforts are needed) as baseline. At mean time/stage2 phase, we would focus on option 2 to make progress as much as possible. |
| Qualcomm | Yes | Since Option 2 provides a way to lower the SCG activation delay, we think it is quite desirable to have it. Without this, we will not have achieved much on this topic. |
| OPPO | Maybe | Before decide option 2, there are lots of open issues need to confirm based on the summary of section 8.2.2. |
| Lenovo, Motorola Mobility | No | Agree with Apple. Option 2 has more details to check compared to Option 1, then naturally consumes more time. But this should not be the reason to deprioritize.  P.S. We suppose QC’s answer is actually “No” according to the comment. |
| NEC | Yes | in general, considering progress and time available, it would be good to prioritize essentials after next meeting. if RAN2 aim at supporting option 2, RAN2 should make some progress for it in next meeting. |
| KDDI | No | We agree with Apple, op1 is just a usual way to reactive the SCG, while op2 is used to achieve faster SCG activation. |
| Sharp | Too early to decide | Before discussing deprioritisation of option 2, we should make more progress on UE behaviours (beam management, RLM, BFD, etc.) in deactivated SCG. |
| China Telecom | Yes | Obviously, the option 1 is a baseline. Considering the sever debate on the option 2, if there is no progress on option 2, it should be deprioritized. |
| vivo | No | Both Option 1 and Option 2 are needed.  Option 2a (without RACH before TA timer expire) is more like legacy UE Scell activation behaviour.  Furthermore, we even can seperate UL and DL in option2. For UL insync case, the UE still can monitors PDCCH for CFRA for UL sync when the cell is in activation state and just suspend UL transmission. |
| Samsung | Yes | This has been on the table for quite some time, eating up valuable meeting time and blocking overall progress so we really need to conclude. Overall the progress for this WI has been quite limited so far. We think that in general we should really stop considering lots of small nice to have type of enhancements. I.e. noting that we seem to have a large number of variants for option 2.. |
| Spreadtrum | Yes,but | Anyway, the UE has to perform RACH if TA is invalid and Option 1 can be the baseline. But in order to achieve gain of fast SCG activation, some enhancement can be considered. We think Option 2a could be the easier agreed one. |
| MediaTek | Yes | Option 1 is anyway baseline and should be finialized. Option 2 is just a small enhacement but may consume too much time. |
| Ericsson | No | We have a clear preference to keep option 2 as it facilitates the SCG activation to become significantly faster than the legacy SCG addition. |
| CATT | No | We think option1 is the baseline for SCG re-activation. Option2 which is considered for reducing activation delay is important for efficient SCG activation/deactivation. Therefore, we don’t think it can be deprioritised. |

**Q2: Do you see other alternatives to the above mentioned a/b?**

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| Company | Comments |
| Apple | We should also discuss the case where UE initiates the SCG re-activation (to transmit data). Atleast here, we think RACH (option 1) is atleast the default option. The other option is UAI. |
| Futurewei | It appears to us the network decided (b) or UE decide (a) RACH could complement with each other. If reduction of SCG activation delay is critical and reliability of RACH decision is important, both alternatives could work together. If due to time limitation only one alternative to be selected and worked on, we consider work on b) first. It seems that b) has less spec impact. |
| Qualcomm | No, we do not see other alternatives. |
| Lenovo, Motorola Mobility | No. a) seems easier to get agreed. Not sure if explicit command from NW as b) is necessary. |
| Sharp | No. a) is easier to agree. For b), it is unclear how UE behaves when TAT is not running. |
| vivo | No. 2a) is easier to agree and is more like legacy UE Scell activation behaviour. The network can control it based different TA timer value. |
| Ericsson | We think there may not be a clear distinction between a) UE control and b) network control. In a), network can control UE behaviour by including or not the reconfigurationWithSync. If reconfigurationWithSync is included, UE triggers RA. If reconfigurationWithSync is not included, there needs to be clear rule when UE can access without RA, e.g. if it did not detect BFD.  In b), even if network does not include reconfigurationWithSync, UE may need to use RA if BFD was detected. |
| CATT | No, we do not see other alternatives except for a) and b). |

**Q3: Do you see other point for option 2 for which it may be possible to reach a majority view in an email discussion?**

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| Company | Comments |
| Apple | We propose that option 2A (NW configures if the UE can skip RACH) that hopefully can be agreed quickly, so we can focus on option 2B.  Since RACH should always be an option for the UE (as a fail-safe mechanism).  Option 1 is always present |
| Futurewei | We see option 2 would be the efforts under this WI for allowing the fast SCG activation. |
| Lenovo, Motorola Mobility | No. a) seems easier to get agreed. Not sure if explicit command from NW as b) is necessary. |
| NEC | At first, option 2 (if supported) should be under network control.  Then, FFS on how to control (e.g. implicitly via presence of reconfig with sync or explicitly via indication), need of UE confirmation on TA timer (i.e. running or stopped) on top of NW control. These FFS points are to be discussed after deciding which message (prepared by which node(s)) is used for activation. Otherwise, it is difficult to consider in details of option 2 |
| Sharp | We should focus on option 2a at first. |
| vivo | Option 2a, yes. |
| MediaTek | We don’t know how NW control (option 2a) could work as NW does not know whether the serving beam is still suitable for the UE. |
| Ericsson | We think that RAN2 should discuss the evaluation criteria when comparing solutions. An important evaluation criteria, besides power saving, is how fast the SCG activation would potentially be compared to legacy (i.e. SCG release/add). While option 1 provides a baseline solution, it can actually be questioned to what degree option 1 would meet the WID objective on **Efficient** SCG activation/deactivation. |
| CATT | a) seems is a better solution. We are not sure whether the network can learn whether the TA value is still valid and the DL sync is kept for the UE. |

## 2.2 UE-triggered SCG activation

If there are SCG bearers while the SCG is deactivated, it is necessary that the UE can trigger SCG activation in case there are uplink data to be transmitted on an SCG bearer. In this case, the following two options were considered

a) The UE indicates to the MCG that there are uplink data for an SCG bearer

b) The UE initiates RACH to the SCG

The rapporteur suggests deciding at the next meeting which method(s) is (or are) supported when there are uplink data for an SCG bearer while the SCG is deactivated.

**Q3: Do you agree to discuss by email and decide at next meeting which method(s) to support for the case of uplink data arrival on an SCG bearer while the SCG is deactivated?**

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| Company | Yes/No | Comments |
| Huawei | Yes |  |
| Apple | Yes | We agree. But we think, op-b should always be allowed for the UE (and hope that RAN2 converges on this quickly in the email discussion, so we don’t need to discuss online). Then we can focus on items in Q4 ☺. |
| Futurewei | Yes |  |
| Qualcomm | Yes |  |
| OPPO | Yes | We should also discuss the detailed scenario which can trigger UE to send indication to the network for SCG deactivation. |
| Lenovo, Motorola Mobility | Yes |  |
| NEC | Yes | Also, it’s good to discuss whether RAN2 should not support both for exactly same purpose |
| KDDI | Yes | Share the view with NEC |
| Sharp | Yes |  |
| China Telecom | Yes |  |
| vivo | Yes |  |
| Samsung | Yes | We hope this will not just be SoH, but that we will start by technical discussion and establishing common view on this. I.e. it would be good to identify any issues we see with the options. E.g. for option b), what does this mean regarding SN ability to reject activation, how does this work with network based control of RA (see 2b in previous section) |
| Spreadtrum | Yes |  |
| MediaTek | Yes |  |
| Ericsson | Yes | The discussion should also include a question whether SCG deactivation should be supported for SCG DRB. To progress the work, it would be best to say it is not supported. Option b) increases complexity and is only to improve latency for SCG activation with SCG DRB. With split DRB, latency is lower and BSR reporting via MCG is already supported. |
| CATT | yes |  |

**Q4: Do you see additional points that could be included in the email discussion?**

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| Company | Comments |
| Apple | We see that the email discussion is on the scenario of moving the UE out of SCG deactivated state. But we also need to consider the case of moving the UE to SCG deactivated state, and while it is under NW control, we have been using UAI from Rel-15/16 and we see that it is very important to re-use this for UE’s request to move it to SCG deactivated state. We may discuss the details in the UAI and if there is no convergence we should atleast add to have an indication by the UE to the NW.  We should also conclude that there is no UL during SCG deactivated state (if there is no convergence, then atleast in Rel-17). |
| Futurewei | RAN2 has agreed that RRC signalling is defined for the interaction between UE/MN and MN/SN in SCG activation/deactivation. FFS if lower-layer signalling is needed. There are companies think MAC CE could also be used as the activation command for delay sensitive use cases. This deserves further discussion and decision. |
| Qualcomm | The following proposals on UE initiated SCG (de)activation can be tried since they had some support:   * UE triggering SCG activation due to MCG failure in deactivated. * Use of UE Assistance Information for UE initiated SCG deactivation. |
| OPPO | The following issues are proposed as mentioned in [R2-2104942]: How to support fast MCG recovery after SCG deactivation?How to use UE capability after SCG deactivation? |
| Lenovo, Motorola Mobility | Issues about power allocation could be worth checking too   * if MCG transmission is still constrained by the maximum transmit power for MCG upon SCG deactivation. * if a MCG PHR should be triggered upon SCG activation. |
| China Telecom | The details of UE-initiated deactivation of SCG may need further discussed. |
| Ericsson | Whether UE triggers fast MCG link recovery when SCG is deactivated as this is the only use case when option a) cannot be used for activation. Simplest would be that the UE performs RRC re-establishment when MCG fails during when SCG is deactivated. |
| CATT | There are following points can be discussed in the email discussion:  - UE behavior upon MCG occurs RLF while SCG deactivation.  - The UE capability limitation in MN side while SCG deactivation. |

# 3 Conclusion

To be updated.

# 4 References