3GPP TSG-RAN WG2 #116bis-e R2-2201701

Electronic Meeting, 17 – 25 January, 2022

Agenda Item: 8.2.2.1

Source: Samsung

Title: [AT116bis-e][221][DCCA] MAC aspects (Samsung)

WID/SID: LTE\_NR\_DC\_enh2-Core

Release: Rel-17

Document for: Discussion and Decision

# 1 Introduction

This document is to handle the following email discussion:

* [AT116bis-e][221][DCCA] MAC aspects (Samsung)

Scope: Discuss the following topics: 1) How to define the "partial MAC reset" for SCG deactivation? 2) What are the MAC actions SCG activation (e.g. is PHR triggered, are some variables reset, etc.)? 3) Other MAC aspects related to SCG deactivated state (e.g. CSI-RS reporting)

Intended outcome: Discussion summary in R2-2201701.

Deadline: Deadline 3

Deadline 3 (discussions for 2nd week Mon/Tue online):

* Comment deadline: Thursday W1, 1600 UTC (for collecting views)
* Rapporteur proposals: Friday W1, 0900 UTC (proposed resolution of issues)
* Document deadline: Monday W2, 1200 UTC (report or agreed CRs)
* No extensions to this deadline for regular discussions. Discussions handling CRs may continue to 1-week email (based on chair decision).

The following documents are to be treated in this email discussion:

#### 8.2.2.1 Deactivation of SCG and UE behaviour in deactivated SCG

By Email [221] (4+1)

Partial MAC reset for SCG deactivation:

[R2-2200601](file:///D:\01_RAN2%20meeting\2022%200117%20RAN2-116bis\내부%20준비%20회의%20관련\Docs\R2-2200601.zip) Partial MAC reset upon SCG deactivation Samsung Electronics Polska discussion LTE\_NR\_DC\_enh2-Core

[R2-2201416](file:///D:\01_RAN2%20meeting\2022%200117%20RAN2-116bis\내부%20준비%20회의%20관련\Docs\R2-2201416.zip) Partial MAC reset upon SCG deactivation DENSO CORPORATION discussion Rel-17 LTE\_NR\_DC\_enh2-Core

[R2-2201075](file:///D:\01_RAN2%20meeting\2022%200117%20RAN2-116bis\내부%20준비%20회의%20관련\Docs\R2-2201075.zip) UE behavior in deactivated SCG and SCG deactivation Qualcomm Incorporated discussion Rel-17

*(only P10-P14 relevant for MAC)*

[R2-2201319](file:///D:\01_RAN2%20meeting\2022%200117%20RAN2-116bis\내부%20준비%20회의%20관련\Docs\R2-2201319.zip) Remaining issues for MAC procedure in deactivated SCG SHARP Corporation discussion Rel-17 LTE\_NR\_DC\_enh2-Core

Does MAC allow CSI-RS reporting when SCG is deactivated?:

[R2-2201296](file:///D:\01_RAN2%20meeting\2022%200117%20RAN2-116bis\내부%20준비%20회의%20관련\Docs\R2-2201296.zip) CSI-RS reporting for deactivated SCG MediaTek Inc. discussion

#### 8.2.2.2 Activation of deactivated SCG

[R2-2201562](file:///D:\01_RAN2%20meeting\2022%200117%20RAN2-116bis\내부%20준비%20회의%20관련\Docs\R2-2201562.zip) Efficient SCG activation Ericsson discussion LTE\_NR\_DC\_enh2-Core

* Only P11 is discussed online (P4-8 can be discussed under by [222] and P1,2,12,13 can be discussed under [221])

By Email [221] (1)

PHR reporting for deactivated SCG and triggering upon SCG activation:

[R2-2200584](file:///D:\01_RAN2%20meeting\2022%200117%20RAN2-116bis\내부%20준비%20회의%20관련\Docs\R2-2200584.zip) PHR issues for SCG activation Samsung Electronics Polska discussion LTE\_NR\_DC\_enh2-Core

By Email ([221] and [222], depending on proposals)

UE-initiated SCG activation:

[R2-2200542](file:///D:\01_RAN2%20meeting\2022%200117%20RAN2-116bis\내부%20준비%20회의%20관련\Docs\R2-2200542.zip) Futher discussion on UE initiated SCG fast activation Futurewei discussion Rel-17 LTE\_NR\_DC\_enh2-Core R2-2110909

[R2-2200605](file:///D:\01_RAN2%20meeting\2022%200117%20RAN2-116bis\내부%20준비%20회의%20관련\Docs\R2-2200605.zip) Activation of deactivated SCG ZTE Corporation, Sanechips discussion Rel-17 LTE\_NR\_DC\_enh2-Core

[R2-2200637](file:///D:\01_RAN2%20meeting\2022%200117%20RAN2-116bis\내부%20준비%20회의%20관련\Docs\R2-2200637.zip) Discussion on activation of deactivated SCG Spreadtrum Communications discussion Rel-17

[R2-2200649](file:///D:\01_RAN2%20meeting\2022%200117%20RAN2-116bis\내부%20준비%20회의%20관련\Docs\R2-2200649.zip) UP details of deactivated SCG activation Transsion Holdings discussion Rel-17

[R2-2200772](file:///D:\01_RAN2%20meeting\2022%200117%20RAN2-116bis\내부%20준비%20회의%20관련\Docs\R2-2200772.zip) Discussion on SCG activation Lenovo, Motorola Mobility discussion Rel-17

[R2-2200882](file:///D:\01_RAN2%20meeting\2022%200117%20RAN2-116bis\내부%20준비%20회의%20관련\Docs\R2-2200882.zip) Open issues in activation of SCG Nokia, Nokia Shanghai Bell discussion Rel-17 LTE\_NR\_DC\_enh2-Core

[R2-2200895](file:///D:\01_RAN2%20meeting\2022%200117%20RAN2-116bis\내부%20준비%20회의%20관련\Docs\R2-2200895.zip) Remaining issues on SCG (de)activation CMCC discussion Rel-17 LTE\_NR\_DC\_enh2-Core

[R2-2201060](file:///D:\01_RAN2%20meeting\2022%200117%20RAN2-116bis\내부%20준비%20회의%20관련\Docs\R2-2201060.zip) Activation of deactivated SCG Qualcomm Incorporated discussion Rel-17

[R2-2201249](file:///D:\01_RAN2%20meeting\2022%200117%20RAN2-116bis\내부%20준비%20회의%20관련\Docs\R2-2201249.zip) Considerations on Activation of Deactivated SCG CATT discussion Rel-17 LTE\_NR\_DC\_enh2-Core

[R2-2201362](file:///D:\01_RAN2%20meeting\2022%200117%20RAN2-116bis\내부%20준비%20회의%20관련\Docs\R2-2201362.zip) Discussion on SCG activation and deacitvation LG Electronics Inc. discussion LTE\_NR\_DC\_enh2-Core

[R2-2201393](file:///D:\01_RAN2%20meeting\2022%200117%20RAN2-116bis\내부%20준비%20회의%20관련\Docs\R2-2201393.zip) Activation of deactivated SCG vivo discussion LTE\_NR\_DC\_enh2-Core

[R2-2201431](file:///D:\01_RAN2%20meeting\2022%200117%20RAN2-116bis\내부%20준비%20회의%20관련\Docs\R2-2201431.zip) SCG/split bearer handling upon SCG deactivation and SCell state upon SCG activation Sharp discussion Rel-17 LTE\_NR\_DC\_enh2-Core

[R2-2201538](file:///D:\01_RAN2%20meeting\2022%200117%20RAN2-116bis\내부%20준비%20회의%20관련\Docs\R2-2201538.zip) Conditional reconfiguration execution while SCG is deactivated Sharp discussion Rel-17 LTE\_NR\_DC\_enh2-Core

[R2-2201641](file:///D:\01_RAN2%20meeting\2022%200117%20RAN2-116bis\내부%20준비%20회의%20관련\Docs\R2-2201641.zip) Activation of SCG InterDigital discussion Rel-17 LTE\_NR\_DC\_enh2-Core Late

#### 8.2.2.3 Other aspects of SCG activation/deactivation

By Email ([221], [222] or [223], depending on proposals) (4)

Other aspects of SCG (de)activation:

[R2-2201073](file:///D:\01_RAN2%20meeting\2022%200117%20RAN2-116bis\내부%20준비%20회의%20관련\Docs\R2-2201073.zip) Other aspects of SCG activation/deactivation Qualcomm Incorporated discussion Rel-17

[R2-2201317](file:///D:\01_RAN2%20meeting\2022%200117%20RAN2-116bis\내부%20준비%20회의%20관련\Docs\R2-2201317.zip) Deactivation of SCG LG Electronics Finland discussion Rel-17 LTE\_NR\_DC\_enh2-Core

[R2-2201333](file:///D:\01_RAN2%20meeting\2022%200117%20RAN2-116bis\내부%20준비%20회의%20관련\Docs\R2-2201333.zip) Discussion on SCG (de)activation NTT DOCOMO, INC. discussion Rel-17

[R2-2201575](file:///D:\01_RAN2%20meeting\2022%200117%20RAN2-116bis\내부%20준비%20회의%20관련\Docs\R2-2201575.zip) Rest issues of SCG Activation LG Electronics discussion Rel-17 LTE\_NR\_DC\_enh2-Core R2-2111018

2 Contact Information

The rapporteur encourages the delegates who provide input to fill their contact information in the below table:

|  |  |
| --- | --- |
| Company | Contact: Name (E-mail) |
| Samsung (Donggun Kim) | s\_dg.kim@samsung.com |
| Wenjuan Pu | wenjuan.pu@vivo.com |
| Apple | naveen.palle@apple.com |
| OPPO | wangshukun@oppo.com |
| Nokia | Jarkko.t.koskela@nokia.com |
| Futurewei | Jialinzou88@yahoo.com |
| Ericsson (Zhenhua Zou) | zhenhua.zou@ericsson.com |
| LG | San (geumsan.jo@lge.com) |
| Huawei, HiSilicon | david.lecompte@huawei.com |
| Qualcomm | punyaslo@qti.qualcomm.com |
| CATT | Erlin.zeng@catt.cn |
| MediaTek | chun-fan.tsai@mediatek.com |
| NTT DOCOMO | riki.ookawa.rp@nttdocomo.com |
| DENSO | daiki.maemoto.j7w@jp.denso.com |
| Sharp | kyosuke\_inoue@sharp.co.jp |
| Lenovo, Motorola Mobility | Zhangcc16@lenovo.com |

# 3 Discussion

## 3.1 MAC aspects

Firstly, we can discuss the details of partial MAC reset.

The first action to be discussed is

1> initialize *Bj* for each logical channel to zero;

This action can be done upon SCG activation for fairness among logical channels. On the other hand, given that the network can release and add logical channel configuration (e.g. RLC bearer configuration) to initialize *Bj* values according to LCP procedure, it can be up to network implementation upon SCG activation, i.e. the network can initialize them by using RRCReconfiguration including SCG activation indication, if needed. In this regard, the action can be done as a part of partial MAC reset upon SCG deactivation since no critical problem would be foreseen.

* Option 1. Initialize Bj for each logical channel to zero upon SCG activation as a separate procedure.
* Option 2. Initialize Bj for each logical channel to zero upon SCG deactivation as a part of partial MAC reset.

**Q1. Which option do you prefer if you agree that UE should do this action related to MAC reset for SCG activation/deactivation? or do you have any other suggestion?**

|  |  |  |
| --- | --- | --- |
| Company | Preferred option | Comments |
| vivo | Option 2 | In the last RAN2 meeting, RAN2 has agreed that upon SCG deactivation, instruct the SCG MAC entity to perform partial MAC reset. It is reasonable to initialize Bj as a part of MAC reset. And since there is no SCG transmission during SCG deactivation, no need to initialize Bj again upon SCG activation. So, we prefer option 2. |
| Apple | Ok with Op2 |  |
| OPPO | Option 2 | In my understanding, the MAC reset behavior is same as legacy MAC reset behavior in section 5.12 except TAT timer and dedicated RACH resource. |
| Nokia | Option 1 | No reason to differentiate from normal MAC reset. It seems companies think option 2 is existing mac reset but that is not the case in our understanding |
| Futurewei | Option 1 | Option 1 is fine. |
| Ericsson | Option 1 | As Rapportuer explained, B\_j should be re-set to the correct value (i.e, zero) upon SCG activation.  Release and add logical channel may work, but it does not seem to capture the possiblity that the network can also re-establish the RLC entity. It is not our preference to force the network to perform release/add just to ensure B\_j is set to the correct value.  If RAN2 does not agree on option 1, it does not make sense either to initialize B\_j at the SCG de-activation. |
| LG | Option 2 |  |
| Samsung | Option 2 | It would be better to avoid a separate procedure only for this since there is a way to reset *Bj* value by network configuration, if needed. |
| Huawei, HiSilicon | Option 2 |  |
| Qualcomm | Option 1 | Rapporteur’s comment on the need for resetting upon activation seems fine. |
| CATT | Option 1 |  |
| MediaTek | Option 2 |  |
| DENSO | Option 2 | Agree with Samsung to duplicate the similar procedure twice, given that (the existing) MAC reset at SCG activation was not chosen in the last meeting. |
| Sharp | Option 2 | We assume that “Initialize” means “There is no last incremented Bj”. |
| Lenovo, Motorola Mobility | Option 2 |  |

The second actions to be discussed is

1> stop (if running) all timers;

1> consider all *timeAlignmentTimer*s as expired and perform the corresponding actions in clause 5.2;

As RAN2 agreed, the only timer to be kept would be *timeAlignmentTimers.* So it seems straightforward to have the following action as a part of partial MAC reset upon SCG deactivation.

1> stop (if running) all timers except *timeAlignmentTimer*s;

**Q2. Do you agree that UE should do this action as a part of partial MAC reset upon SCG deactivation? or do you have any other suggestion?**

|  |  |  |
| --- | --- | --- |
| Company | Yes or No | Comments |
| vivo | Yes | Actually, stopping some specific timers does not bring clear benefit, but there is no harm to do this. For simplicity, the UE can just stop all timers except TAT. |
| Apple | Yes |  |
| OPPO | Yes |  |
| Nokia | Yes |  |
| Futurewei | Yes | Per RAN2 agreement. |
| Ericsson | No, the exception shall also include *BeamFailureDetectionTimer* | It is agreed to continue BFD in SCG de-activation state and not reasonable to stop the *beamFailureDetectionTimer*, if UE is configured to continue BFD. |
| LG | Yes |  |
| Samsung | Yes, but | Ericsson’s comment sounds reasonable. |
| Huawei, HiSilicon | Yes |  |
| Qualcomm | No | Agree with Ericsson on this. |
| CATT | Yes |  |
| Mediatek | Yes, but | We can also keep BFD timer running |
| DOCOMO | Yes | This aligns with RAN2 agreement. |
| DENSO | Yes, but | Ericsson’s comment sounds reasonable. And it is also not reasonable to *beamFailureRecoveryTimer,* if needed*.* |
| Sharp | Yes, but | OK with Ericsson’s comment for *beamFailureDetectionTimer* |
| Lenovo, Motorola Mobility | Yes, but | Fine with ericsson’s comment |

The third action to be discussed is

1> discard explicitly signalled contention-free Random Access Resources for 4-step RA type and 2-step RA type, if any;

This action is related to whether to allow dedicated RACH resources indicated before SCG activation indication (when going to the SCG deactivated state or while the SCG is deactivated). If it is allowed, then UE should keep CFRA resources. Otherwise, this action can be performed as a part of partial MAC reset upon SCG deactivation.

* Option 1. discard explicitly signalled contention-free Random Access Resources for 4-step RA type and 2-step RA type, if any;
* Option 2. Do not discard explicitly signalled contention-free Random Access Resources for 4-step RA type and 2-step RA type, if any;

**Q3. Which option do you prefer if you agree that UE should do this action as a part of partial MAC reset upon SCG deactivation? or do you have any other suggestion?**

|  |  |  |
| --- | --- | --- |
| Company | Preferred option | Comments |
| vivo | Option 2 | First, we think there is no benefit to restrict the network flexibility on this aspect. If the NW has concern to reserve CFRA resources for SCG activation, the NW can decide not configure the dedicated RACH resource to the UE. While if the NW wants to speed up SCG activation, for example, to support MAC CE based SCG activation or allow RACH-based UE initiated SCG activation, the NW is enabled to provide CFRA resources before SCG activation. So, we prefer to allow the NW to pre-config the CFRA resources before SCG activation. And if provided, the UE should not discard it. |
| Apple | Op 2 | We also mentioned this in discussion #223. Op1 will not allow NW to configure dedicated resources to the UE if the UE discards them at deactivation of SCG. |
| OPPO | Option 2 |  |
| Nokia | Option 1 | NW can reconfigure upon activation if it intends to. |
| Futurewei | Option 1 | It is not worth to let the UE to lock the dedicated resource from the beginning of the deactivation.  Deactivated SCG could stay for long time and if the UE holds the dedicated resource for deactivated SCG, the on-going normal mobility UEs will not be able to use it. Otherwise, the resource would be used by many UEs for their HOs. It will compromise the mobility performance in high UE density areas.  It has been agreed in RAN2, the dedicated resources can be configured at the activation if the network decided to do so. This allows CFRA and will be more efficient. |
| Ericsson | Option 1 | Any CFRA resource can be provided in the RRC message that contains SCG activation command.  In Option 2, not to discard CFRA resource might be useful, if the UE can initiate SCG activation but this has not been agreed yet. The option 2 also raises the follow-up questions on the validity duration of the CFRA resources and so a further complication. |
| LG | Option 2 | In #223, it is discussed whether the dedicated RACH resources should be configured for the purpose of faster MCG failure recovery. If dedicated RACH resources for MAG failure recovery is introduced, RAN2 should go Option 2. |
| Samsung | Option 1 | This issue is related to another discussion, #223. It would be better to revisit this, if needed. |
| Huawei, HiSilicon | Option 1 is already realized by legacy TS 38.331 | Which "explicitly signalled contention-free Random Access Resources" are discussed here?  rach-ConfigDedicated in ReconfigurationWithSync is "Need N", so this configuration is not stored by the UE, and nothing about this needs to be specified in MAC specification. |
| Qualcomm | Option 2 |  |
| CATT | Option 1 | Agree with the above point that NW can configure CFRA resources if needed using the SCG activation command. |
| MediaTek | Option 1 |  |
| DOCOMO | Option 1 | CFRA resource can be allocated and informed via SCG activation indication message. As for Option 2, we a bit concern resource allocated for UEs in SCG deactivated state remains unusable until SCG is activated or released. |
| DENSO | Option 1 | Agree with Futurewei. |
| Sharp | Option 1 |  |
| Lenovo, Motorola Mobility | Option 1 |  |

The fourth action to be discussed is

1> reset all *BFI\_COUNTER*s;

RAN2 agreed to support BFD and RLM for deactivated PSCell. Therefore, the UE continues to perform BFD and RLM even after SCG deactivation, if configured. In this case, UE should not reset *BFI\_COUNTER* for deactivated PSCellsince UE still performs BFD and RLM for the same TCI state on the same BWP.However, UE should reset all BFI\_COUNTERs if BFD and RLM are not configured upon SCG deactivation.In addition to this, the UE should reset *BFI\_COUNTER* if the TCI state and BWP are changed and if BFD and RLM are configured.

Note that the legacy SCell deactivation does not reset *BFI\_COUNTER* as well as *beamFailureDetectionTimer*s, and BFD cannot be performed if SCell is deactivated. So, we can follow the legacy procedure for SCells because RAN2 already agreed to deactivate SCells of SCG for deactivated SCG.

Moreover, given that 38.321 already specified the initialization procedure for beam failure detection as shown below, UE will reset *BFI\_COUNTER* if the TCI state and BWP are changed and if BFD and RLM are configured.

1> if *beamFailureDetectionTimer*, *beamFailureInstanceMaxCount*, or any of the reference signals used for beam failure detection is reconfigured by upper layers associated with this Serving Cell:

2> set *BFI\_COUNTER* to 0.

In this regard, the following action would be enough.

1. reset all *BFI\_COUNTER*s if BFD and RLM are not configured for deactivated SCG;

**Q4. Do you agree that UE should do this action as a part of partial MAC reset upon SCG deactivation? or do you have any other suggestion?**

|  |  |  |
| --- | --- | --- |
| Company | Yes or No | Comments |
| vivo | Partial agree | We prefer:   1. reset all *BFI\_COUNTER*s ~~if BFD and RLM are not configured for deactivated SCG~~;   The reasons are as follows:  - If BFD is not configured for deactivated SCG, the values of BFI\_COUNTERs and beamFailureDetectionTimer will be outdated when activating the SCG, so it is reasonable to reset BFI\_COUNTERs and beamFailureDetectionTimer when deactivating the SCG.  - If BFD is configured for deactivated SCG, there is no quick beam failure detection requirement since there will be no data transmission during SCG deactivation, so it seems also fine to reset BFI\_COUNTERs and beamFailureDetectionTimer upon SCG deactivation.  So, the condition “if BFD and RLM are not configured for deactivated SCG” seems not needed. |
| Apple | Agree, but needs some critical clarifications | Our intention is that if the RRC message that deactivates SCG does not ‘change’ anything on the RLM/BFD ‘AND’ if the UE supports BFD/RLM in deactivated SCG (a UE capability that we have to discuss), then the UE does not reset. Otherwise the UE resets. |
| OPPO | Yes | In my understanding, RAN2 agreed that BFD and RLF supporting for deactivated SCG is up to network configuration. |
| Nokia | No | Firstly, RLM does not affect MAC and hence should not be listed.  Secondly, if BFD is performed only for PSCell, then the BFI\_COUNTERs of SCells should be reset.  Hence, could reformulate to:  „1> if PSCell is configured for beam failure detection for deactivated SCG:  2> reset all *BFI\_COUNTERs* except *BFI\_COUNTER* associated with PSCell.  1> else:  2> reset all *BFI\_COUNTERs*.”  On the other hand, if BFD can be performed also for SCells, then should only reset BFI\_COUNTERS for serving cells for which BFD not configured. The above TP could hence be:  „1> if at least one Serving Cell is configured for beam failure detection for deactivated SCG:  2> reset all *BFI\_COUNTERs* except *BFI\_COUNTERs* associated with Serving Cells configured for beam failure detection.  1> else:  2> reset all *BFI\_COUNTERs*.” |
| Futurewei |  | The text proposed by Nokia sound reasonable and the details could be further discussed. |
| Ericsson | Yes, but | As replied in Q2, the UE shall not stop the *beamFailureDetectionTimer* if BFD is configured. On the other hand, the UE shall stop the *beamFailureDetectionTimer* if BFD is not configured.  Not sure the need to mention RLM here at the MAC spec.. can be removed? |
| LG | No | We also prefer the following text as in legacy MAC reset.   1. reset all *BFI\_COUNTER*s ~~if BFD and RLM are not configured for deactivated SCG;~~   Even if all BFI\_COUNTERs reset regardless of whether the BFD is configured or not, we do not see the problem. As motioned by vivo, there is no quick beam failure detection requirement while de-activating the SCG. |
| Samsung | Yes, but | Based on comments from others, it would be better to remove “RLM” even if BFD and RLM are configured by one parameter in RRC message.  Technically, there is no reason to re-count BFI\_COUNTER from 0 if BFD continues.  SCG deactivation will deactivate SCell of SCG according to RAN2 agreement. Note that legacy SCell deactivation does not reset BFI\_COUNTER. So, simply we can do nothing if BFD is configured for deactivated SCG while we can reset all BFI\_COUNTERs like legacy MAC reset if BFD is not configured for deactivated SCG. |
| Huawei, HiSilicon | Yes |  |
| Qualcomm | Yes | Should remove RLM from the clause. |
| CATT | Yes |  |
| MediaTek |  | For SCell, we prefer to follow legacy behavior while SCell is deactivated. (i.e. reset counter and NO BFD in SCell). The following behavior could apply for SCells in deactivated SCG  1> if the SCell is deactivated as specified in clause 5.9:  2> set *BFI\_COUNTER* to 0;  2> consider the Beam Failure Recovery procedure successfully completed and cancel all the triggered BFRs for this Serving Cell.  For PSCell, the BFI counter could continue if BFD is configured for deactivated SCG. Otherwise, the BFI counter should be reset. |
| DOCOMO | Yes | “and RLM” should be removed. |
| DENSO | Yes | In my understanding, RAN2 agreed that BFD and RLF supporting for deactivated SCG is up to network configuration. |
| Sharp | Yes | We are also fine with Nokia’s TP. |
| Lenovo, Motorola Mobility | Yes |  |

The next actions to be discussed are

1> set the NDIs for all uplink HARQ processes to the value 0;

1> stop, if any, ongoing Random Access procedure;

1> flush Msg3 buffer;

1> flush MSGA buffer;

1> cancel, if any, triggered Scheduling Request procedure;

1> cancel, if any, triggered Buffer Status Reporting procedure;

1> cancel, if any, triggered Power Headroom Reporting procedure;

1> cancel, if any, triggered Configured uplink grant confirmation;

1> flush the soft buffers for all DL HARQ processes;

1> for each DL HARQ process, consider the next received transmission for a TB as the very first transmission;

1> release, if any, Temporary C-RNTI.

The above actions can be performed as a part of partial MAC reset upon SCG deactivation.

**Q5. Do you agree that UE should do these actions as a part of partial MAC reset upon SCG deactivation? or do you have any other suggestion?**

|  |  |  |
| --- | --- | --- |
| Company | Yes or No | Comments |
| vivo | Yes | Since there will be no SCG transmission during SCG deactivation, all the above actions to be performed upon SCG deactivation seem reasonable. |
| Apple | Yes, but | We also need to keep in mind the outcome of #223 (MCG failure recovery using deactivated SCG, and if SR can be used for this). We are ok with stopping the SR (and RACH) at deactivation, the UE can start again if needed (in case RAN2 progress on #223). |
| OPPO | Yes |  |
| Nokia | Yes |  |
| Futurewei | Yes |  |
| Ericsson | Yes, but | What about the LBT\_COUNTERs? It might be okay to preclude the actions related with V2X, IAB, since we don’t see any use-case for those yet. But for NR-U, maybe it is clearer that this can be useful for SCG deactivation, or ? |
| LG | Yes |  |
| Samsung | Yes |  |
| Huawei, HiSilicon | Yes in general | Not sure about the Temporary C-RNTI, in which case would the UE have that? |
| Qualcomm | Yes |  |
| CATT | Yes |  |
| MediaTek | Yes |  |
| DOCOMO | Yes |  |
| DENSO | Yes |  |
| Sharp | Yes |  |
| Lenovo, Motorola Mobility | Yes |  |

In legacy, the common understanding is that the corresponding BWP is deactivated when a SCell is deactivated. Based on this principle, we can apply the same principle to the BWP associated with PSCell.

**Proposal. The BWP associated with PSCell is deactivated upon SCG deactivation.**

**Q6. Do you agree to this proposal? or do you have any other suggestion?**

|  |  |  |
| --- | --- | --- |
| Company | Yes or No | Comments |
| vivo | Maybe | **Case 1:** the PSCell BWP is activated during SCG deactivation.  If we support this case, then according to the MAC spec, the UE behavior defined for SCG deactivation in SCG activation/deactivation section will be not aligned with the UE behavior defined for active BWP in the BWP operation section. This maybe solved by adding a clarification in the SCG activation/deactivation section.  **Case 2:** the PSCell BWP is deactivated during SCG deactivation.  If we support this case, the following issues should be discussed:   * How does the UE perform BFD/RLM while the SCG is deactivated, considering the BFD/RLM RS is configured per BWP? E.g., the network indicates which BWP is used for this purpose or network can configure per UE level RLM/BFD configuration. * What is the active BWP of PSCell upon SCG activation? In our view, it can be first active BWP of PSCell or the BWP on which the UE performed BFD/RLM during SCG deactivation. * According to the current 331 spec, upon reconfiguring first active BWP ID for PSCell, the BWP indicated by this ID should be activated immediately. So, we need to discuss how to avoid this behavior. In our understanding, we can add some restriction on UE behavior or network configuration. |
| Apple | No | We think bringing deactivation/activation brings more issues, and it’s better to leave BWP as is. BWP ‘switch’ if any, can be dealt with a SCG re-activation (using RRC message). |
| OPPO | No | RAN2 agreed that all SCG SCell is deactivated state when SCG is deactivated. But for PSCell, it is not clear. In my understanding, PSCEll is not deactivated state, because CSI reporting, BFD….are supported on PSCEll. The further discussion about PSCell state should be discussed in RAN2. |
| Nokia | Yes |  |  | Does not seem necessary to send CSI reports while there is no data transmission |
| Futurewei |  | No action is required for the BWP. |
| Ericsson | No | The UE perform RLM and BFD in PSCell. It is not correct to say that the BWP is de-activated.  SCell and PSCell deactivation are quite different things, so there seems no motivation to say that BWP is deactivated for PSCell. |
| LGE | Yes |  |
| Samsung | Yes | Our understanding is that PSCell is deactivated upon SCG deactivation according to current running MAC CR. Then, it seems reasonable to deactivate BWP. The exceptional behaviour, e.g. BFD, etc. should be defined separately in RAN1 or RAN2 specification. |
| Huawei, HiSilicon | No | A BWP needs to remain activated in order to perform RLM/BFD |
| Qualcomm | No | Agree with Ericsson and Huawei on this. |
| CATT | No | Agree with Ericsson and Huawei. |
| MediaTek | No | Same view as Huawei |
| DENSO | No | Same as Ericsson and Huawei, a BWP needs to activated in order to perform RLM/BFD, if configured. |
| Sharp | Yes | Agree with Samsung. |
| Lenovo, Motorola Mobility | No | As Ericsson and Huawei explained. |

Regarding CSI-RS reporting of deactivated PSCell, sending CSI-RS reporting on the deactivated PSCell would just increase power consumption given that no data transmission is ongoing. Moreover, sending CSI reporting for the deactivated PSCell via MCG would request additional inter-node message design and may not worth it considering the inter-node delay. The basic PSCell quality could be maintained by RLM/BFD mechanism.

**Proposal. CSI-RS reporting in the deactivated PSCell or for the deactivated PSCell is NOT supported.**

**Q7. Do you agree to this proposal? or do you have any other suggestion?**

|  |  |  |
| --- | --- | --- |
| Company | Yes or No | Comments |
| vivo | No strong view | It is beneficial for fast SCG activation that CSI-RS measurement and reporting can be performed when TAT is still running during SCG deactivation. However, if the majority do not want to support, we are also fine for progress. |
| Apple | Yes | We agree this is not essential for Rel-17. |
| OPPO | No | RLM/BFD is detected in UE side and CSI reporting to network aims to aid the network to do scheduling. So I do not think the BFD/RLM can also used for scheduling. |
| Nokia | Yes | Does not seem necessary to send CSI reports while there is no data transmission |
| Futurewei | Yes | It has been agreed in RAN2. |
| Ericsson | Yes | BFD should be good enough as compromise between readiness for activation and power consumption and we therefore not need CSI measurement and reporting. |
| LG | Yes | The UE should not perform CSI-RS report in SCG deactivated state because CSI-RS report increases the power consumption. However, we support to perform CSI-RS measurement for the fast SCG activation. |
| Samsung | Yes |  |
| Huawei, HiSilicon | Yes |  |
| Qualcomm | Yes | CSI-RS reporting consumes power and requires UE to maintain UL timing with SN in SCG deactivated. |
| CATT | Yes |  |
| MediaTek | Yes (Proponent) | In response to OPPO, there is no data scheduling in deactivated SCG so the need for CSI reporting is not clear. At this stage, we should use simple approach to complete the WI. |
| DOCOMO | Yes | We do not see reason to report while no UL data allowed. Moreover, as Rapporteur concerns, CSI-RS reporting via MN suffers from inter-node delay, so we think the report is out-of-date. |
| DENSO | Yes |  |
| Sharp | No | CSI report can be used by NW to optimize DL parameters for UE so that any services can be initiated faster with high quality when SCG is activated. Therefore, periodic CSI reporting should be supported in deactivated SCG. |
| Lenovo, Motorola Mobility | Yes |  |

In RAN2#116e it was agreed that UE indicates via the MCG that it has UL data to send for SCG DRBs, FFS indication contents and format.

The data volume calculation procedure in the PDCP specs and the RLC specs are used for the buffer status reporting triggering in the MAC spec. The same procedures can be re-used for reporting UE buffer status but rather deliver to the RRC layer due to that the message is encoded at the RRC layer. For SCG DRBs, if the total amount of PDCP data volume and RLC data volume pending for initial transmission is larger than zero, then the UE can indicate it in an RRC message.

On the other hand, one indication could be enough given that UE can send BSR MAC CE after SCG activation as in legacy, i.e. no further optimization would be needed.

* Option 1. The UE indication of uplink data and the total data volume (e.g. long BSR MAC CE) can be included in UE Assistance Information message.
* Option 2. Only the UE indication of uplink data can be included in UE Assistance Information message. BSR can follow the legacy procedure.

**Q8. Which option do you prefer? or do you have any other suggestion?**

|  |  |  |
| --- | --- | --- |
| Company | Preferred option | Comments |
| vivo | Option 2 | This question has been covered by the offline [222]. Better to discuss this issue in [222] since this issue is related to UL aspect not MAC aspect. |
| Apple | Op 2 | Same view as Vivo |
| OPPO | None | In my understanding, the MCG MAC cannot report SCG BSR right currently, right? So option 1 does not work.  One indication for the UL data arrival is simple. The indication is included in RRC message or MAC CE, it can be discussed further. |
| Nokia | Option 2 | One bit indication is enough to indicate UL data arrival for SCG. |
| Futurewei | Option 1 | Option 1 takes the advantage of UE initiated RRC SCG activation request to carry information which should be reported by the UE. Option 2 should also work to get the information after the UE access to the SN with additional delay and signaling overhead. |
| Ericsson | Option 1 | A timely report of the Buffer Status from the UE to the network is always beneficial for the network to schedule the correct amount of radio resources upon SCG activation, to reduce the latency of the packet delivery. To add a detailed total data volume in the RRC is very simple and beneficial.  NOTE that this question is also handled in offline [222]. We should avoid double discussion, and suggest to treat this topic as part of [222]. |
| LG |  | This issue has been already discussed in offline 222. |
| Samsung | Option 2 | OK to leave it to offline 222. |
| Huawei, HiSilicon | Offline 222 |  |
| Qualcomm | Option 2 | This is a simple option.  Option 1 might not be as much useful for reducing the scheduling delay, since the MN-SN interaction to decide whether to activate the UE might contribute more to the activation delay.  Also, if network decides to keep the SCG deactivated upon receiving the indication (for whatever reasons), then transmitting the data volume indication would have served no purpose. |
| CATT | Option 1 | Option 1 provides more assistance information to MN which help the MN to make the decision of SCG activation or SCG bearers reconfiguration.  The issue has been discussed in offline [222]. |
| MediaTek | Option 2 | At it is overlapped with offline 222 |
| DENSO | Op 2 | Same view as Vivo |
| Sharp | Option 2 | It is sufficient to inform that there is an uplink data and any required information can be transmitted after SCG activation. The similar discussion could be found on Q1 of [222], so please see our comments on there. |

PSCell can be activated and deactivated based on SCG activation and deactivation indication from network. For deactivated PSCell, the UL BWP behavior would not include any uplink transmission, i.e. the uplink power control would not be needed and thus it seems reasonable not to include the PHR report for deactivated PSCell.

**Proposal. For deactivated PSCell, PHR is not reported.**

Note that this proposal would not have any impact on the MAC specification.

**Q9. Do you agree to this proposal? or do you have any other suggestion?**

|  |  |  |
| --- | --- | --- |
| Company | Yes or No | Comments |
| vivo | Yes | It is obvious. |
| Apple | Yes | In the deactivated SCG state, no PHR is needed. |
| OPPO | Not sure | RAN2 agree to support to keep TAT running when SCG is deactivated. The purpose is to skip RACH procedure and can receive scheduling directly when SCG is activated. So the PHR and CSI reporting are necessary.  Please note that RAN2 did not agreed that PSCell is deactivated state during SCG deactivation. |
| Nokia | Yes | The PHR would anyway be reported to MCG MAC entity only and by the PSCell Serving Cell ID in the bitmap set to 0 the MCG can deduce no report is present (and knows the SCG is deactive). |
| Futurewei | Not completely | In most cases, it is true. But in case of UE initiated activation, the UE could report PHR via RRC activation request before the SCG is activated. It would be beneficial for RACH less activation to minimize the delay. |
| Ericsson | Yes | Perhaps what is interesting to discuss is whether the PHR can be triggered or not when SCG is de-activated.  At least, even if a PHR is triggered, PHR is not reported. In the MAC spec, the report is written under the condition that:  If the MAC entity has UL resources allocated for a new transmission the MAC entity shall: |
| LG | Yes |  |
| Samsung | Yes |  |
| Qualcomm | Yes |  |
| CATT | Yes |  |
| MediaTek | Yes |  |
| DOCOMO | Yes |  |
| DENSO | Yes |  |
| Sharp | Yes |  |
| Lenovo, Motorola Mobility | Yes |  |

In the legacy MAC specification, PHR is triggered upon addition of the PSCell, i.e. PSCell is newly added or changed. However, given that the feature of SCG activation/deactivation is introduced, we need to note that the uplink transmission would start after SCG activation from deactivated SCG. Therefore, a new PHR trigger would be beneficial to help the network manage fast uplink power control, i.e. PHR can be triggered in case that PSCell is activated. One can argue that it would be beneficial to trigger a PHR upon SCG deactivation as well but it would be the next step.

**Proposal. PHR is triggered upon activation of the PSCell.**

**Q10. Do you agree to this proposal? or do you have any other suggestion?**

|  |  |  |
| --- | --- | --- |
| Company | Yes or No | Comments |
| vivo | Yes |  |
| Apple | Yes |  |
| OPPO | Not sure | We need confirm the PSCell state during SCG deactivation first. |
| Nokia | Yes | Should also be triggered for deactivation to update the power situation even if the PH for the deactivated PSCell itself is not reported in the PHR. |
| Futurewei | Yes in general, but | It can be different under different scenarios.   1. When RACH is required, PHR should be reported after random access is completed per legacy procedure.   For RACH-less case, if the activation is network initiated, PHR report will be scheduled after the UE received the activation command. If the activation is UE initiated, PHR report can be carried by the UE issued activation request. |
| Ericsson | Yes |  |
| LG | Yes |  |
| Samsung | Yes |  |
| Huawei, HiSilicon | Not sure | Isn't it related to the question of UE power sharing while the SCG is deactivated? |
| Qualcomm | Yes |  |
| CATT | Yes |  |
| MediaTek | Yes |  |
| DOCOMO | Yes |  |
| DENSO | Yes |  |
| Sharp | Yes |  |
| Lenovo, Motorola Mobility | Yes |  |

If the proposal related to Q10 is agreeable, then the text proposal could be controversial. We need to note that RAN2 had the same discussion about whether to trigger a PHR for re-activation of SCell, several times before, i.e. whether to limit the PHR triggering to the case that SCell is activated from deactivated state. It has ended up with no such limitation. We can follow the legacy principle of SCell. On the other hand, such limitation would have no harm and thus could be acceptable based on the majority view.

* Option 1. Activation of the PSCell (the same as activation of SCell).
* Option 2. Activation of the PSCell from deactivated state.

**Q11. If you say yes for Q10, which option do you prefer? or do you have any other suggestion?**

|  |  |  |
| --- | --- | --- |
| Company | Preferred option | Comments |
| vivo | Option 1 | Both are ok, and fine to follow the legacy principle of SCell. |
| Apple | We do not understand Op 1, as to what does it mean: activation of PSCell other than from deactivated SCG state | PHR to be triggered when UE moves out of SCG deactivated state to activated state. |
| OPPO |  | We need confirm the PSCell state during SCG deactivation first. |
| Nokia | Option 1? | Activation of PSCell always happens from deactivated state – no similar issue as with SCell due to no MAC CE based activation.  Hence, either option works. |
| Futurewei |  | See our response to Q10. Don’t see much difference between option 1 and 2. |
| Ericsson |  | Not sure i have understood the comments by the rapportuer.. they are the same or is it more stage-3 detail, or ?? |
| LG | Option 1 | We prefer to follow the legacy principle. |
| Samsung | Option 1 | The intention was to discuss stage-3 details, i.e. how to specify the triggering condition even if re-activation issue like SCell may not exist. |
| Huawei, HiSilicon | There is no difference | We do not see how the SCG could be activated not from deactivated state |
| Qualcomm | Do not understand Option 1 | Our understanding is that PHR should be triggered upon transition from SCG deactivated to activated. |
| CATT | Option 1 |  |
| MediaTek |  | Assuming that MAC CE activation is NOT support  We don’t know how SCG could be re-activated while already in activated state? |
| DOCOMO | Option 1 | We understand this question is only about wording, since there is no difference at least until new state (e.g. dormant?) is newly supported in NR. We prefer to follow TP of SCell case, but we align with majority view. |
| DENSO |  | Don’t see much difference between option 1 and 2. |
| Sharp |  | Both options are fine with us. |
| Lenovo, Motorola Mobility |  | We also dont see the difference.. |

If the proposal related to Q10 is agreeable, then it may have an impact on the legacy procedure because RAN2 agreed that SCG can be added/changed with activated state or deactivated state. If PSCell is added/changed with deactivated state, then the PHR doesn’t have to be triggered upon addition of PSCell. Hence, the following proposal could be beneficial.

**Proposal. PHR is triggered upon addition of the PSCell (i.e. PSCell is newly added or changed with activated state).**

**Q12. If you say yes for Q10, do you agree to this proposal? or do you have any other suggestion?**

|  |  |  |
| --- | --- | --- |
| Company | Yes or No | Comments |
| vivo | Yes |  |
| Apple | PHR is triggered when the PSCell is activated (either as a new PSCell using RRC, or just using RRC for re-activation of existing deactivated PSCell). |  |
| OPPO |  | It is current behavior, right?  ===  - addition of the PSCell (i.e. PSCell is newly added or changed); |
| Nokia | No | It is reasonable to trigger the PHR and report to MCG even for addition of deactivated PSCell. |
| Futurewei |  | Have similar view as Apple at high level. Details could be different under different scenarios as our response to Q10. |
| Ericsson | No | It should be: PHR is triggered upon activation of the PSCell (i.e. either when PSCell is added in activated state or when activity state is changed from deactivated to activated). |
| LG | Yes |  |
| Samsung | Yes | The intention was the change to the legacy condition as shown below:  - addition of the PSCell (i.e. PSCell with activated state is newly added or changed); |
| Huawei, HiSilicon |  | Addition of SCG in activated state should be like legacy. Addition of SCG in deactivated state could trigger PHR if that is agreed for deactivation of SCG, otherwise no. |
| Qualcomm | No | PHR should be triggered upon PSCell addition with activated state. We do not see the purpose of reporting PHR (on the MCG) for a deactivated PSCell. |
| CATT |  | Agree with Apple. |
| MediaTek | No | Same view as QC |
| DOCOMO | Yes | Agree with Samsung. If Q9 is agreed on yes, UE cannot report PHR for a newly added/changed deactivated PSCell. |
| DENSO |  | Same view as Huawei. |
| Sharp | Yes |  |
| Lenovo, Motorola Mobility | No | If the PSCell is added deactivated, we dont see the need of PHR. |

# Conclusion

**TBD**