3GPP TSG-RAN WG2 Meeting #111 Electronic DRAFT R2-2008138

Elbonia, 17 – 28 August 2020

**Agenda item: 6.8.1**

**Source: Nokia, Nokia Shanghai Bell**

**Title: [AT111-e][208][DCCA] Corrections SCell dormancy (Nokia)**

**WID/SID: LTE\_NR\_DC\_CA\_enh-Core - Release 16**

**Document for: Discussion and Decision**

# 1 Introduction

This is the following email discussion (Please note that scope says 38.331 CRs but when checked with chairman also 38.321 CRs were intended to be covered):

* **[AT111-e][208][DCCA] Corrections SCell dormancy (Nokia)**

Scope:

* Collect companies’ feedback for the 38.331 CRs under 6.8.1, 6.8.2 and 6.8.3.1 marked for this email discussion
* Proponents may provide updated versions (if needed) under this email discussion (Tdoc numbers can be requested for this purpose from the session chair or the RAN2 secretary)

        Intended outcome:

* Discussion summary in [R2-2008138](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_111-e/Docs/R2-2008138.zip) (by email rapporteur).
* Session chair proposes agreements after the summary report is available

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

* Deadline for companies' feedback:  Thursday 2020-08-20 09:00 UTC
* Deadline for rapporteur's summary (in [R2-2008138](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_111-e/Docs/R2-2008138.zip)):  Friday 2020-08-21 09:00 UTC
* Deadline for CR finalization (for agreed CRs): Thursday 2020-08-27 07:00 UTC

For simple CRs only a table has been added where people can reflect their opinion on CR. Reason for the CR can be found in the cover sheet. but if there are some unclarities regarding reasoning then additional questions may be added for companies to comment.

# 2 Configuration of sCellState

These papers are related to configuration of sCellState:

[R2-2007006](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_111-e/Docs/R2-2007006.zip) Correction on the Configuration of sCellState for 38.331 CATT CR Rel-16 38.331 16.1.0 1768 - F LTE\_NR\_DC\_CA\_enh-Core

*(moved from 6.8.3.3)*

[R2-2007007](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_111-e/Docs/R2-2007007.zip) Correction on the Configuration of sCellState for 36.331 CATT CR Rel-16 36.331 16.1.1 4366 - F LTE\_NR\_DC\_CA\_enh-Core

*(moved from 6.8.3.3)*

 *(moved from 6.8.3.3)*

So reason for change for above papers is written as (from 36.331 CR – 38.331 is analogous removing corresponding part from 38.331):

However, in NR the SCell state can be configured upon PSCell change. Therefore, for NE-DC, the SCell state should also be configured upon PSCell change, which algins with NR-DC and (NG)EN-DC.

Furthermore, the E-UTRA *sCellToAddModList* can’t be configured in NR *RRCResume* message directly. It should be the *sCellToAddModListSCG* included in an E-UTRA *RRCConnectionReconfiguration* message which embedded in *NR RRCResume* message

|  |  |  |
| --- | --- | --- |
| Company | Agree / Not Agree | Comments |
| Nokia | Agree (partly) | If a CR is agreed both should be agreed and coversheet should indicate dependency. Anyway purpose seems to be correct and we are OK to agree this with corrections to cover sheet. |
| Samsung | Agree | Agree to the intention and we are fine with Nokia’s suggestion. |
| Qualcomm | Agree | Agree with Nokia’s suggestion  |
| Huawei | Agree |  |
| OPPO | Agree |  |

# 3 Stage 2 changes regarding Dormant BWP

By Email [208]

[R2-2007691](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_111-e/Docs/R2-2007691.zip) Correction on UL behaviours in the dormant BWP Huawei, HiSilicon CR Rel-16 38.300 16.2.0 0286 - F LTE\_NR\_DC\_CA\_enh-Core

|  |  |  |
| --- | --- | --- |
| Company | Agree / Not Agree | Comments |
| Nokia | Agree  | This seems to be adding valid points to stage-2 currently missing |
| Samsung | Agree (partly) | No strong opinion since it is specified in other part but OK to add it. |
| Qualcomm | Agree | We think we indeed missed to capture it in 38.300 |
| Huawei | Agree (proponent) |  |
| OPPO | Agree |  |

# 3 MAC changes regarding Dormant BWP

By Email [208]

*SCell reactivation:*

[R2-2006679](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_111-e/Docs/R2-2006679.zip) Discussion on Scell reactivation in a dormant and non-dormant BWP SHARP Corporation discussion Rel-16 LTE\_NR\_DC\_CA\_enh-Core

 *(moved from 6.8.1)*

In this paper it was identified that in case of reactivation of dormant SCell following observations were raised with nice coloring for the corresponding part in the MAC specification:

**Observation 1**: when dormant BWP is introduced, a reactivated Scell could be either in a dormant BWP or in a non-dormant BWP before a Scell A/D MAC CE is received.

In 5.9 Activation/Deactivation of SCells[1], it is described as below

|  |
| --- |
| [...]The MAC entity shall for each configured SCell:1> if an SCell is configured with *sCellState* set to *activated* upon SCell configuration, or an SCell Activation/Deactivation MAC CE is received activating the SCell:2> if *firstActiveDownlinkBWP-Id* is not set to dormant BWP:3> activate the SCell according to the timing defined in TS 38.213 [6]; i.e. apply normal SCell operation including:4> SRS transmissions on the SCell;4> CSI reporting for the SCell;4> PDCCH monitoring on the SCell;4> PDCCH monitoring for the SCell;4> PUCCH transmissions on the SCell, if configured.3> if the SCell was deactivated prior to receiving this SCell Activation/Deactivation MAC CE, or an SCell is configured with *sCellState* set to *activated* upon SCell configuration:4> activate the DL BWP and UL BWP indicated by *firstActiveDownlinkBWP-Id* and *firstActiveUplinkBWP-Id* respectively;3> start or restart the sCellDeactivationTimer associated with the SCell according to the timing defined in TS 38.213 [6];3> (re-)initialize any suspended configured uplink grants of configured grant Type 1 associated with this SCell according to the stored configuration, if any, and to start in the symbol according to rules in clause 5.8.2;3> trigger PHR according to clause 5.4.6.2> else if *firstActiveDownlinkBWP-Id* is set to dormant BWP:3> stop the *bwp-InactivityTimer* of this Serving Cell, if running.3> if the SCell was deactivated prior to receiving this SCell Activation/Deactivation MAC CE, or if an SCell is configured with *sCellState* set to *activated* upon SCell configuration:4> activate the DL BWP and UL BWP indicated by *firstActiveDownlinkBWP-Id* and *firstActiveUplinkBWP-Id* respectively;3> start or restart the *sCellDeactivationTimer* associated with the SCell according to the timing defined in TS 38.213 [6].[...] |

Since the C-fields in a Scell A/D MAC CE indicate the activation/deactivation status of the SCell, when a Scell A/D MAC CE is received, if the corresponding C field is set as 1, it could be considered as activating the Scell, no matter the Scell is in activated or deactivated state. So the grey part also applies to an activated Scell. Considering current spec, for an activated Scell working in a dormant BWP, when it is reactivated, the *firstActiveDownlinkBWP-ID* has to be checked (highlighted in red). If *firstActiveDownlinkBWP-Id* is not set to dormant BWP, normal SCell operation in a non-dormant BWP will be applied, such as PDCCH monitoring, CSI reporting and etc.

However, the reactivated Scell is activated and working in a dormant BWP before the Scell A/D MAC CE is received. The green part referring to BWP switching is not applied. So it is not clear which non-dormant BWP the UE has to switch to for the Scell to apply the required normal operation in non-dormant BWP.

**Observation 2**: When a Scell A/D MAC CE is received, a reactivated Scell in a dormant BWP has to perform required PDCCH monitoring, CSI reporting and etc. It is not clear how it is done in current spec.

And for an activated Scell working in a non-dormant BWP, the *bwp-InactivityTimer* could be running if the Active BWP is not the *initialDownlinkBWP/ defaultDownlinkBWP-Id.* However, when it is reactivated*,* if *firstActiveDownlinkBWP-Id* is set to dormant BWP, UE has to stop the *bwp-InactivityTimer* of this SCell (in blue part). And since the reactivated Scell is activated prior to receiving of Scell A/D MAC CE, the yellow part referring to BWP switching is not applicable.

The *bwp-InactivityTimer* could be stopped when active DL BWP is a dormant BWP or within a RA procedure. Conversely, it is not clear if the timer is stopped, any BWP switching is implicitly required. Furthermore, if BWP switch is implicitly required by stopping the timer, it should be clarified which BWP will be switched to.

**Observation 3**: When a Scell A/D MAC CE is received, a reactivated Scell in a non-dormant BWP has to stop the *bwp-InactivityTimer* if running. However, it is not clear if a consequent BWP switching is implicitly required or not, and if yes, which BWP should be switched to.

Please provide you company view on observations and need to correct them:

|  |  |  |
| --- | --- | --- |
| Company | Agree / Not Agree | Comments |
| Nokia | Agree (at least mostly) | In fact there seems to be small problem on reactivating SCells after we introduced dormancy. It seems that if the Dormant SCell is reactivated ,1. In case dormant BWP was active for the SCell upon re-activation, SCell should not apply normal operation including SRS transmission, CSI reporting, PDCCH monitoring, etc. but should still follow what is specified for the dormant BWP in clause 5.15.1. Furthermore, configured uplink grants should not be (re-)initialized in this case and neither PHR to be triggered.
2. firstActiveDownlinkBWP-Id and firstActiveUplinkBWP-Id are activated when SCell was previously active no matter if the firstActiveDownlinkBWP-Id is dormant BWP or not.
3. *sCellDeactivationTimer* is restarted no matter if the *firstActiveDownlinkBWP-Id* is set to dormant BWP or not

This kind of behaviour was not intention of RAN2 but just unfortunate result of the CR. We think this shall be corrected.  |
| Samsung | Agree | Agree to the observations, which was not the intended behaviour. To resolve these issues, we provide one of the possible changes as follows:The MAC entity shall for each configured SCell:1> if an SCell is configured with *sCellState* set to *activated* upon SCell configuration, or an SCell Activation/Deactivation MAC CE is received activating the SCell:2> if the SCell was deactivated prior to receiving this SCell Activation/Deactivation MAC CE, or an SCell is configured with *sCellState* set to activated upon SCell configuration:23> if *firstActiveDownlinkBWP-Id* is not set to dormant BWP:34> activate the SCell according to the timing defined in TS 38.213 [6]; i.e. apply normal SCell operation including:45> SRS transmissions on the SCell;45> CSI reporting for the SCell;45> PDCCH monitoring on the SCell;45> PDCCH monitoring for the SCell;45> PUCCH transmissions on the SCell, if configured.23> else if *firstActiveDownlinkBWP-Id* is set to dormant BWP:34> stop the *bwp-InactivityTimer* of this Serving Cell, if running.3> activate the DL BWP and UL BWP indicated by *firstActiveDownlinkBWP-Id* and *firstActiveUplinkBWP-Id* respectively.2> start or restart the *sCellDeactivationTimer* associated with the SCell according to the timing defined in TS 38.213 [6];2> if the active DL BWP is not the dormant BWP:3> (re-)initialize any suspended configured uplink grants of configured grant Type 1 associated with this SCell according to the stored configuration, if any, and to start in the symbol according to rules in clause 5.8.2.2> trigger PHR according to clause 5.4.6.3> trigger PHR according to clause 5.4.6;1> else if an SCell Activation/Deactivation MAC CE is received deactivating the SCell; or1> if the *sCellDeactivationTimer* associated with the activated SCell expires:2> deactivate the SCell according to the timing defined in TS 38.213 [6];2> stop the *sCellDeactivationTimer* associated with the SCell;2> stop the *bwp-InactivityTimer* associated with the SCell;2> deactivate any active BWP associated with the SCell;2> clear any configured downlink assignment and any configured uplink grant Type 2 associated with the SCell respectively;2> clear any PUSCH resource for semi-persistent CSI reporting associated with the SCell;2> suspend any configured uplink grant Type 1 associated with the SCell;2> flush all HARQ buffers associated with the SCell;2> cancel, if any, triggered consistent LBT failure for the SCell.1> if PDCCH on the activated SCell indicates an uplink grant or downlink assignment; or1> if PDCCH on the Serving Cell scheduling the activated SCell indicates an uplink grant or a downlink assignment for the activated SCell; or1> if a MAC PDU is transmitted in a configured uplink grant and LBT failure indication is not received from lower layers; or1> if a MAC PDU is received in a configured downlink assignment:2> restart the *sCellDeactivationTimer* associated with the SCell.1> if the SCell is deactivated:2> not transmit SRS on the SCell;2> not report CSI for the SCell;2> not transmit on UL-SCH on the SCell;2> not transmit on RACH on the SCell;2> not monitor the PDCCH on the SCell;2> not monitor the PDCCH for the SCell;2> not transmit PUCCH on the SCell. |
| Qualcomm | Not agree | We agree with the observations, which was not the intended behaviour. However, we don’t think MAC spec change is needed:* In legacy, if an activated SCell receives activation MAC CE, it does not take any action (i.e. we think that it is considered an error case by the UE). We think it is a general principle in RAN2 that we usually do not specify UE behaviours in error scenario.
* In Rel-16, it is possible that a SCell may not be configured with dormant BWP. Then if we make spec change for this small issue, that would mean we need to define different behaviors for SCell de-/activation MAC CE depend on whether a SCell is configured with dormant BWP or not.  But we fail to see any benefits in doing that. In fact, since it would be a slower option for switching an SCell out of dormant BWP, we doubt it would be used at all even if it is allowed. If it is not going to be used in reality, then why should we specify it?

Based on above analysis, we suggest to just capture below agreement in RAN2 Chair notes:“*If an activated SCell is configured with dormant BWP, the UE is not expected to receive MAC-CE to re-activate the SCell*” |
| Huawei | Agree with Samsung's proposed changes | Also, we are confused by "if an SCell is configured with *sCellState* set to *activated* upon SCell configuration": it seems 38.321 is saying to take some action based on RRC parameter and condition specified in TS 38.321 while the real conditions are I TSTherefore, we suggest replacing this with "if configured by upper layers to consider the SCell to be in activated state, as specified in TS 38.331 clause 5.3.5.5.9". |
| OPPO | Not agree  | Agree with QC. 1. if an activated SCell receives activation MAC CE, it does not take any action.
2. The PHR trigger due to SCell activation only based on the SCell activation from deactivation. So, we propose the CR[[R2-2006810](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_111-e/Docs/R2-2006810.zip)/[R2-2006811](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_111-e/Docs/R2-2006811.zip)] to clarify the PHR trigger due to scell activation.

This issue is discussed in the email discussion in last RAN2 meeting, based on the above two bullets, no change is needed. |

# 3.1 MAC – Dormant state corrections

*Dormant UE behaviour:*

[R2-2007217](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_111-e/Docs/R2-2007217.zip) correction on the UE behaviour on dormant state vivo CR Rel-15 36.321 15.9.0 1491 - F LTE\_NR\_DC\_CA\_enh-Core, LTE\_euCA-Core

[R2-2007218](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_111-e/Docs/R2-2007218.zip) correction on the UE behaviour on dormant state vivo CR Rel-16 36.321 16.1.0 1492 - A LTE\_NR\_DC\_CA\_enh-Core, LTE\_euCA-Core

|  |  |  |
| --- | --- | --- |
| Company | Agree / Not Agree | Comments |
| Nokia | Agree  | Intention is correct but as the PUCCH cannot be configured for dormant SCell. Current specification is bit confusing about talking PUCCH for dormant SCell. |
| Samsung | Agree | No problem with the current text but we are fine with the proposed change to avoid confusion. |
| Qualcomm  | Not agree | "PUCCH-SCell can't enter dormant state" is already captured in 36.300. Thus, we don't think this statement in 36.321 will make confusion. However, if we remove it, it may make people misunderstand that PUCCH can be sent in dormant state.Thus, we prefer to keep the current spec. If company really want to clarify it in 36.321, we think it can be captured in 1st paragraph of Section 5.22  |
| Huawei | Not agree | ̂We should not agree editorial CRs to Rel-15 now, this is a waste of time. |
| OPPO | Not agree  | Agree with QC. |

[R2-2007219](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_111-e/Docs/R2-2007219.zip) correction on the UE behaviour on dormant BWP vivo CR Rel-16 38.321 16.1.0 0810 - F LTE\_NR\_DC\_CA\_enh-Core

|  |  |  |
| --- | --- | --- |
| Company | Agree / Not Agree | Comments |
| Nokia | Agree (partly and even more changes needed) |  Correct – PUCCH is not supported and thus having this written as action for SCell activated with dormant BWP is misleading.But also additionally when one reads 5.15.1 one can notice that there are other issues as well:1. Transmission on RACH is not prevented for SCell with dormant BWP active. This is not aligned with RAN2 agreement.
2. “Perform periodic or semi-persistent CSI measurement for the BWP, if configured;” does not prevent any reporting. Furthermore, MAC does not perform measurements but defines how the reporting is done.

All of the listed issues should be corrected (and possibly we can also do some clean up) assuming these are agreeable by RAN2. |
| Samsung | Agree | The same view as Nokia. |
| Qualcomm  | Not agree | "The dormant BWP is one of the UE’s dedicated BWPs configured by network via dedicated RRC signalling. TheSpCell and PUCCH SCell cannot be configured with a dormant BWP. " is already captured in section 10.6 of 38.300. Thus, we don't think this statement in 38.321 will make confusion. However, if we remove it, it may make people misunderstand that PUCCH can be sent when SCell is in dormant.Thus, we prefer to keep the current spec. If company really want to clarify it in 38.321, we think it can be captured in 4th paragraph of Section 5.15.1 of 38.321 |
| Huawei | Agree | but this should be in a general cleanup CR. |
| OPPO | Not agree  | It is same as the previous changes in LTE. Agree with QC. |

# MAC – Clarifications on PHR triggering:

[R2-2006810](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_111-e/Docs/R2-2006810.zip) Clarifications on PHR triggers-R15 OPPO CR Rel-15 38.321 15.9.0 0786 - F NR\_newRAT-Core

[R2-2006811](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_111-e/Docs/R2-2006811.zip) Clarifications on PHR triggers-R16 OPPO CR Rel-16 38.321 16.1.0 0787 - F LTE\_NR\_DC\_CA\_enh-Core

|  |  |  |
| --- | --- | --- |
| Company | Agree / Not Agree | Comments |
| Nokia | Not Agree | In our understanding intention was to trigger PHR for reactivation case as well. |
| Samsung | Not Agree | Our understanding is that RAN2 had the same discussion in LTE and concluded to trigger PHR for SCell reactivation case long times ago, i.e. the current NR text inherited from this. Considering dormant BWP, we can trigger PHR for Scell reactivation with non-dormant BWP but we don’t need to trigger PHR for Scell reactivation with dormant BWP as RAN2 agreed in the last meeting. |
| Qualcomm | Not agree | Same understanding as Samsung |
| Huawei | Not agree | This is a Rel-15 CR proposal, it is too late. |
| OPPO | Agree (proponent) | It is just a clarification that only scell activation from deactivation, then the PHR report is triggered. If the scell is reactivation, the PHR will not be triggered.**Please reconsider the change in the CR. @nokia, @Samsung, @QC, @Huawei.** |

[R2-2007947](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_111-e/Docs/R2-2007947.zip) Correction on PHR triggering upon BWP switching from dormant BWP to non-dormant BWP Huawei, HiSilicon CR Rel-16 38.321 16.1.0 0871 - F LTE\_NR\_DC\_CA\_enh-Core

|  |  |  |
| --- | --- | --- |
| Company | Agree / Not Agree | Comments |
| Nokia | Not Agree | no need. "Upon change of activated BWP from dormant BWP to non-dormant DL BWP of an SCell of any MAC entity with configured uplink" in PHR section (5.4.6) covers BWP switching.. |
| Samsung | Not Agree | It seems redundant. If the majority want to have this, we can replace “the leaving dormant BWP” to “the switching to non-dormant DL BWP”, which is more aligned with clause 5.4.6. |
| Qualcomm | Not agree | We have added this condition in section 5.9 and section 5.4.6. Thus, we see no need to have duplicated statement |
| Huawei | Proponent |  |
| OPPO | No agree  |  |

[R2-2008014](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_111-e/Docs/R2-2008014.zip) CR on the terminology of PHR trigger Samsung CR Rel-16 38.321 16.1.0 0874 - F LTE\_NR\_DC\_CA\_enh-Core

|  |  |  |
| --- | --- | --- |
| Company | Agree / Not Agree | Comments |
| Nokia | Agree | We are fine to update terminology. If this is agreeable we could consider combining this with CRs agreed to MAC dormant BWP handling (if any).  |
| Samsung | Agree | Just for text alignment with other part of MAC specification. |
| Qualcomm | Agree | Wonder whether it can included in rapporteur CR |
| Huawei | Agree | But this should be in a general cleanup CR. |
| OPPO | Agree  |  |

# 4 RRC changes regarding dormant BWP

By Email [208]

[R2-2007003](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_111-e/Docs/R2-2007003.zip) Correction on the Dormant BWP CATT discussion Rel-16 LTE\_NR\_DC\_CA\_enh-Core

**Do you see need to change need codes of the *dormancyGroupWithinActiveTime* and *dormancyGroupOutsideActiveTime* to need “R”?**

|  |  |  |
| --- | --- | --- |
| Company | Agree / Not Agree | Comments |
| Nokia | Not Agree | How would you release the configuration with need code M?  |
| Samsung | Not Agree | We have some sympathy with the intention. However, we have the same question as Nokia, which would require more change. |
| Qualcomm  | Not agree | Same question as Nokia |
| Huawei | Agree |  |
| OPPO | Not agree |  |

[R2-2007684](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_111-e/Docs/R2-2007684.zip) Correction on dormant BWP Huawei, HiSilicon CR Rel-16 38.331 16.1.0 1881 - F LTE\_NR\_DC\_CA\_enh-Core

|  |  |  |
| --- | --- | --- |
| Company | Agree / Not Agree | Comments |
| Nokia | Agree (but see the comment for need for corrections)  | Intention seems to be correct as there should not be case that NW configures dormant BWP unless there is more than one DL BWP for the serving cell. In the CR there is something wrong with the fonts as the conditions listed at the end seems to be some “garbage”. Please correct these. And as the CR is quite minor we can consider combining CR with some other CR (if we have any other CR for RRC regarding dormancy)  |
| Samsung | Agree | Agree to the intention and its correction with Nokia’s suggestions. |
| Qualcomm  | See comments | The intention is correct. However, we think the wording of change can be updated to:“The network can only configure dormant BWP when the UE is configured with at least two **dedicated** DL BWPs for an SCell.”It is our understanding that dormant BWP is UE dedicated RRC configured BWP. For example, it can’t work in basic BWP operation option 1 (in FG 6-1) although it has two BWPs. |
| Huawei | Proponent | Sorry, can fix the fonts. |
| OPPO | Agree  |  |

# 5 Conclusion

To be seen