**3GPP TSG-RAN WG4 Meeting # 98-bis-e R4-210XXXX**

**Electronic Meeting, 12th – 20th April, 2021**

**Agenda item:** 5.4.1.2, 5.4.2.2

**Source:** Moderator (Ericsson)

**Title:** Email discussion summary for [98-bis-e][205] LTE\_NR\_DC\_CA\_RRM\_2

**Document for:** Information

# Introduction

This email discussion covers the following topics:

* 5.4.1.2 Efficient and low latency serving cell configuration, activation and setup [LTE\_NR\_DC\_CA\_enh-Core]
* 5.4.2.2 Efficient and low latency serving cell configuration, activation and setup [LTE\_NR\_DC\_CA\_enh-Perf]
  + 5.4.2.2.1 General
  + 5.4.2.2.2 Test cases for direct SCell activation
  + 5.4.2.2.3 Test case for SCell Dormancy

The following issues are to be discussed starting from first round:

* Topic #1: Core Requirement Maintenance
  + Sub-topic 1-1: Side condition for Direct SCell activation delay requirement
    - Issue 1-1-1: Principle for branching of requirement
    - Issue 1-1-2: Replacement of measCycleSCell
    - Issue 1-1-3: Definition of known cell in Direct SCell activation
  + Sub-topic 1-2: Applicability of Direct SCell activation delay requirement
    - Issue 1-2-1: Applicability of requirements for Direct SCell activation
* Topic #2: Test Cases
  + Sub-topic 2-1: Test cases for SCell Dormancy
    - Issue 2-1-1: BWP configuration for Dormant BWP
    - Issue 2-1-2: Scheduling/non-scheduling DCI in test cases
    - Issue 2-1-3: CORESET RMC with PDCCH after first 3 OFDM symbols

Please note the following guideline on reducing length of file name for email discussion documents.

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| Length of file names shall be reduced, e.g.   * At the beginning of first round, moderator shares Summary\_101\_1st round\_v01.docx * After update by company A: Summary\_101\_1st round\_v02\_companyA * After update by company B: Summary\_101\_1st round\_v03\_companyA\_companyB * After update by company C: Summary\_101\_1st round\_v04\_companyB\_companyC |

# Topic #1: Core Requirement Maintenance

*Main technical topic overview. The structure can be done based on sub-agenda basis.*

## Companies’ contributions summary

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| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2104860 | Apple | «Core requirement maintenance on direct SCell activation»  **Proposal 1:** When discussing the replacement of measCycleSCell, the principle “if the target cell has been measured less than 160ms before the activation command, then no additional time for AGC is needed” should not be changed.  **Observation 1:** Option 1 is to replace measCycleSCell with correct sample interval, without changing the assumption that “if the target cell has been measured less than 160ms before the activation command, then no additional time for AGC is needed.  **Observation 2:** Mathematically, option 4 is identical to option 1. The difference is that in option 1 sample interval is used while in option 4 measurement period is used.  **Proposal 2:** RAN4 to down select from option 1 and option 4 in RAN4#98-bis-e:   * Option 1: Replace condition on measCycleSCell with Tsample\_interval defined as follows:   + If no DRX is configured or DRX cycle>320ms, Tsample\_interval = Max(MGRP, SMTC period, DRX cycle) × CSSFinter   + Otherwise, Tsample\_interval = 1.5 × Max(MGRP, SMTC period, DRX cycle) × CSSFinter * Option 4:   + TFirstSSB+ 5ms, if the SCell has been measured within measurement gap before activation and TSSB\_measurement\_period\_inter, as specified in Table 9.3.5-1, is equal to or smaller than 1280ms; or if the SCell has been measured without measurement gap before activation and TSSB\_measurement\_period\_intra, as specified in Table 9.3.9-1, is equal to or smaller than 800ms.   + TFirstSSB\_MAX + Trs + 5ms, if the SCell has been measured within measurement gap before activation and TSSB\_measurement\_period\_inter, as specified in Table 9.3.5-1, is larger than 1280ms; or if the SCell has been measured without measurement gap before activation and TSSB\_measurement\_period\_intra, as specified in Table 9.3.9-1, is larger than 800ms.   Associated Draft CR R4-2104861 |
| R4-2106387 | Nokia, Nokia Shanghai Bell | «Discussion on Tactivation\_time for Direct SCell activation»  **Proposal 1:** Use same definition, for known SCell conditions for the NR FR1 cell being directly activated, as in LTE.  **Observation 1:**  The activation delay for a direct activated SCell in FR1would be from acquiring the first SSB (TFirstSSB) plus 5ms.  Associated Draft CR R4-2106388 |
| R4-2106885 | Ericsson | «Core maintenance for Direct SCell activation»  **Proposal 1:** RAN4 to conclude that in Rel-16, activation delay requirements for direct activation of SCell in FR1 are applicable when the SCell is configured with single TCI state.  **Proposal 2:** Replace condition on measCycleSCell with time since last reporting of the cell. If the cell has been reported within last 1280ms, or alternatively, the measurement period is at most 1280ms, then TFirstSSB+ 5ms applies, otherwise TFirstSSB\_MAX + Trs + 5ms applies. |

Draft CRs

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| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2104861 | Apple | «CR for core requirement maintenance on direct SCell activation»  See R4-2104860 |
| R4-2106388 | Nokia, Nokia Shanghai Bell | «Draft CR Correction of activation delay for Direct activated Scell»  See R4-2106387 |
| R4-2106993 | Huawei, HiSilicon | «CR on direct SCell activation»  **Proposal 1:** Add the following condition: The requirements in this clause do not apply if the RRC reconfiguration message is configured for PSCell addition or PSCell change and SCell being directly activated belongs to the SCG. |
| R4-2106994 | Huawei, HiSilicon | «CR on SCell dormancy requirements»  **Proposal 1:** Remove note: *~~Editor’s Note: The requirements are defined in DCI-agnostic manner, if RAN1 defines something that makes Dormant switching time/interruption to always be absorbed into WUS gap, RAN4 can revise the specification text accordingly.~~* |

## Open issues summary

*Before e-Meeting, moderators shall summarize list of open issues, candidate options and possible WF (if applicable) based on companies’ contributions.*

### Sub-topic 1-1: Side condition for Direct SCell activation delay requirement

*Sub-topic description:*

During RAN4#98e it was raised that activation delay requirements for Direct SCell activation indirectly depend on measCycleSCell since requirements are inherited from activation of deactivated SCell. However, a directly activated SCell has not previously been measured according to a measurement period that depends on measCycleSCell. Instead, the SCell may have been measured as an intra- or inter-frequency neighbour cell prior to being directly activated. RAN4 is now discussing how to replace the dependency on measCycleSCell for directly activated SCells.

One company is additionally pointing out that existing definition of known or unknown cell is inherited from requirements on activation of deactivated SCell, and therefore also depends on measCycleSCell. Thus the definition of known/unknown cell in Direct SCell activation may need to be updated.

*Open issues and candidate options before e-meeting:*

**Issue 1-1-1: Principle for branching of requirement**

* Proposals
  + Option 1 (Apple): When discussing the replacement of measCycleSCell, the principle “if the target cell has been measured less than ~~160ms~~ X ms before the activation command, then no additional time for AGC is needed” should not be changed.
  + Option 2 (Nokia):Only split requirements based on known/unknown cell status. Do not further split requirements depending on measurement rate etc for known cells.
* Recommended WF
  + Discussion needed

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| **Company** | **Comments** |
| Nokia | When analyzing the current condition in 38.133 it seems clear that the issue raised in the last meeting relates to Direct SCell activation in FR1. In this case the conditions depend first of all on whether the SCell is known or not, in addition to that the activation latency then depend on known/unknown SCell status.  However, already the known/unknown condition depend on the measCycleSCell which is not defined/configured for a Direct activated SCell. Hence, RAN4 should first address known/unknown condition for the Direct SCell activation in FR1.  After that RAN4 can address what are the suitable activation delay for known/unknown Direct activated SCell in FR1.  We suggest defining the known/unknown condition for Direct SCell activation the same way as is done in LTE. |

**Issue 1-1-2: Replacement of measCycleSCell**

* Proposals
  + Option 1 (Apple): Replace condition on measCycleSCell with Tsample\_interval defined as follows:
    - If no DRX is configured or DRX cycle>320ms, Tsample\_interval = Max(MGRP, SMTC period, DRX cycle) × CSSFinter
    - Otherwise, Tsample\_interval = 1.5 × Max(MGRP, SMTC period, DRX cycle) × CSSFinter
  + Option 2a (Apple): Replace condition on measCycleSCell as follows:
    - TFirstSSB+ 5ms, if the SCell has been measured within measurement gap before activation and TSSB\_measurement\_period\_inter, as specified in Table 9.3.5-1, is equal to or smaller than 1280ms; or if the SCell has been measured without measurement gap before activation and TSSB\_measurement\_period\_intra, as specified in Table 9.3.9-1, is equal to or smaller than 800ms.
    - TFirstSSB\_MAX + Trs + 5ms, if the SCell has been measured within measurement gap before activation and TSSB\_measurement\_period\_inter, as specified in Table 9.3.5-1, is larger than 1280ms; or if the SCell has been measured without measurement gap before activation and TSSB\_measurement\_period\_intra, as specified in Table 9.3.9-1, is larger than 800ms.
  + Option 2b (Ericsson): Replace condition on measCycleSCell as follows:
    - TFirstSSB+ 5ms, if the measurement period is at most 1280ms,
    - TFirstSSB\_MAX + Trs + 5ms, if the measurement period is longer than 1280ms.
  + Option 3 (Ericsson): Replace condition on measCycleSCell as follows:
    - If the SCell is known and has been reported within last 1280ms, Tactivation\_time is TFirstSSB + 5ms,
    - If the SCell is known and has been reported outside last 1280ms, Tactivation\_time is TFirstSSB\_MAX + Trs + 5ms.
  + Option 4 (Nokia): Replace condition on measCycleSCell in NR FR1 as follows, i.e., only consider known/unknown cell status:
    - If the SCell is known and belongs to FR1, Tactivation\_time is TFirstSSB+ 5ms,
    - If the SCell is unknown and belongs to FR1, TFirstSSB\_MAX + TSMTC\_MAX + 2\*Trs + 5ms
* Recommended WF
  + Discussion needed

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| **Company** | **Comments** |
| Nokia | First of all, we believe RAN4 need to address when the Direct activated SCell is considered known. However, the Tactivation\_time depends on whether the Direct activated SCell is known or unknown and the condition for FR1 known SCell (which in our view is referring to the SCell being direct activated) depend on measCycleSCell as well.  Once the conditions for when a direct activated SCell are clear RAN4 can discuss what would be the appropriate Tactivation\_time for the known FR1 SCell.  Otherwise, RAN4 still have unclear requirements as the known conditions for the direct activated FR1 SCell are unclear.  Based on having a definition of the known and unknown status of the SCell being direct activated we propose to explicitly define Tactivation\_time for direct SCell activation not considering measCycleScell. |

**Issue 1-1-3: Definition of known cell in Direct SCell activation**

* Proposals
  + Option 1 (Nokia): Use same definition, for known SCell conditions for the NR FR1 cell being directly activated, as in LTE.
    - [36.133:] The SCell is known provided the following conditions are met for the SCell:
      * During the last 5 seconds before the reception of the direct SCell configuration command:

the UE has sent a valid measurement report for the SCell being directly activated or directly hibernated, and

the SCell being directly activated or directly hibernated remains detectable according to the cell identification conditions specified in section 8.3.3.2,

SCell being directly activated or directly hibernated also remains detectable during the SCell activation delay according to the cell identification conditions specified in section 8.3.3.2

* + - * Otherwise, the SCell is unknown.
* Recommended WF
  + Discussion needed

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| **Company** | **Comments** |
| Nokia | This is the condition used in LTE. It should be possible to use also for NR FR1 Direct SCell activation. |

### Sub-topic 1-2: Applicability of Direct SCell activation delay requirement

*Sub-topic description:*

One company is raising that activation delay requirements for Direct SCell activation in SCG shall only apply when the RRC reconfiguration message does not include addition or change of PSCell. The coverage of RAN4 requirements for Direct SCell activation in Rel-16 is as follows:

* Direct SCell activation at SCell addition
* Direct SCell activation at handover
* Direct SCell activation at RRC resume

*Open issues and candidate options before e-meeting:*

**Issue 1-2-1: Applicability of requirements for Direct SCell activation**

* Proposals
  + Option 1 (Huawei): Add the following condition to Direct SCell activation clauses:
    - The requirements in this clause do not apply if the RRC reconfiguration message is configured for PSCell addition or PSCell change and SCell being directly activated belongs to the SCG.
* Recommended WF
  + Discussion needed

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| **Company** | **Comments** |
| Nokia | Just one clarifying question: Should RAN4 instead define requirements for this scenario if this scenario is seen feasible (as opposed to just stating that no requirements apply)? |

## Companies views’ collection for 1st round

### Open issues

*Please provide comments in the Open issues summary above.*

### CRs/TPs comments collection

*For close-to-finalize WIs and maintenance work, comments collections can be arranged for TPs and CRs. For ongoing WIs, suggest to focus on open issues discussion on 1st round.*

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| **CR/TP number** | **Comments collection** |
| R4-2104861 | «CR for core requirement maintenance on direct SCell activation», Apple |
| Nokia: More discussion needed (pending ongoing discussion) |
| Company B |
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| R4-2106388 | «Draft CR Correction of activation delay for Direct activated Scell», Nokia, Nokia Shanghai Bell |
| Company A |
| Company B |
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| R4-2106993 | «CR on direct SCell activation», Huawei, HiSilicon |
| Nokia: ‘The requirements in this clause do not apply if the RRC reconfiguration message is configured for PSCell addition or PSCell change and SCell being directly activated belongs to the SCG.’  This wording now implies that if the SCell being directly activated in the same RRC reconfiguration message does not belong to the SCG, the requirements apply. And would RAN4 then need to define such requirements?  Principle is ok to address the issue if scenario is valid. However, also pending our question above if RAN4 instead of stating that no requirements apply instead should define requirements for the scenario. Alternative is to make a note that the scenario may lead to longer delay without going into the details of how long delay. |
| Company B |
|  |
| R4-2106994 | «CR on SCell dormancy requirements», Huawei, HiSilicon |
| Nokia: Agreeable |
| Company B |
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## Summary for 1st round

### Open issues

*Moderator tries to summarize discussion status for 1st round, list all the identified open issues and tentative agreements or candidate options and suggestion for 2nd round i.e. WF assignment.*

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|  | **Status summary** |
| **Sub-topic #1** | *Tentative agreements:*  *Candidate options:*  *Recommendations for 2nd round:* |

### CRs/TPs

*Moderator tries to summarize discussion status for 1st round and provides recommendation on CRs/TPs Status update*

*Note: The tdoc decisions shall be provided in Section 3 and this table is optional in case moderators would like to provide additional information.*

|  |  |
| --- | --- |
| **CR/TP number** | **CRs/TPs Status update recommendation** |
| XXX | *Based on 1st round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |

## Discussion on 2nd round (if applicable)

# Topic #2: Test Cases

*Main technical topic overview. The structure can be done based on sub-agenda basis.*

## Companies’ contributions summary

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| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2106995 | Huawei, HiSilicon | «Discussion on remaining issues for SCell dormancy tests»  **Proposal 1:** No need to introduce a new BWP configuration for dormant BWP. In the tests,   * BWP#1 parametrized by DLBWP.1.1 could be the non-dormant BWP, and * BWP#2 parametrized by DLBWP.1.2 could be the dormant BWP   **Proposal 2:** Leave the choice of scheduling/non-scheduling DCI to RAN5 or TE implementation. If RAN4 has to specify it, scheduling DCI is used.  **Proposal 3:** Introduce new CORESET RMC for 15kHz and 30kHz with PDCCH after the first 3 OFDM symbol.  Associated Draft CR R4-2106996 |

Draft CRs

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| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2106884 | Ericsson | «Draft Big CR 38.133: Introduction of Rel-16 MR-DC Direct SCell activation and SCell dormancy RRM performance requirements» |
| R4-2106996 | Huawei, HiSilicon | «draftCR on SCell dormancy TC»  See R4-2106995 |

## Open issues summary

*Before e-Meeting, moderators shall summarize list of open issues, candidate options and possible WF (if applicable) based on companies’ contributions.*

### Sub-topic 2-1: Test cases for SCell Dormancy

*Sub-topic description:*

One company is proposing parameter values and configurations to be used for test cases in SCell dormancy.

* Dormant BWP configuration
* Usage of scheduling/non-scheduling DCI
* Definition of CORESET RMC for PDCCH received after initial 3 OFDM symbols

*Open issues and candidate options before e-meeting:*

**Issue 2-1-1: BWP configuration for Dormant BWP**

* Proposals
  + Option 1 (Huawei): No need to introduce a new BWP configuration for dormant BWP. In the tests,
    - BWP#1 parametrized by DLBWP.1.1 could be the non-dormant BWP, and
    - BWP#2 parametrized by DLBWP.1.2 could be the dormant BWP
* Recommended WF
  + Agree on the proposal.

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| **Company** | **Comments** |
| Vivo | We are ok with option 1 |

**Issue 2-1-2: Scheduling/non-scheduling DCI in test cases**

* Proposals
  + Option 1 (Huawei): Leave the choice of scheduling/non-scheduling DCI to RAN5 or TE implementation. If RAN4 has to specify it, scheduling DCI is used.
* Recommended WF
  + Agree on the proposal.

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| **Company** | **Comments** |
| vivo | Ok with option 1 |

**Issue 2-1-3: CORESET RMC with PDCCH after first 3 OFDM symbols**

* Proposals
  + Option 1 (Huawei): Introduce new CORESET RMC for 15kHz and 30kHz with PDCCH after the first 3 OFDM symbol.
* Recommended WF
  + Agree on the proposal.

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| **Company** | **Comments** |
| vivo | Ok with option 1 |

## Companies views’ collection for 1st round

### Open issues

*Please provide comments in the Open issues summary above.*

### CRs/TPs comments collection

*Major close to finalize WIs and Rel-15 maintenance, comments collections can be arranged for TPs and CRs. For Rel-16 on-going WIs, suggest to focus on open issues discussion on 1st round.*

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| --- | --- |
| **CR/TP number** | **Comments collection** |
| R4-2106884 | «Draft Big CR 38.133: Introduction of Rel-16 MR-DC Direct SCell activation and SCell dormancy RRM performance requirements», Ericsson |
| Company A |
| Company B |
|  |
| R4-2106996 | «draftCR on SCell dormancy TC», Huawei, HiSilicon |
| Company A |
| Company B |
|  |

## Summary for 1st round

### Open issues

*Moderator tries to summarize discussion status for 1st round, list all the identified open issues and tentative agreements or candidate options and suggestion for 2nd round i.e. WF assignment.*

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|  | **Status summary** |
| **Sub-topic#1** | *Tentative agreements:*  *Candidate options:*  *Recommendations for 2nd round:* |

### CRs/TPs

*Moderator tries to summarize discussion status for 1st round and provided recommendation on CRs/TPs Status update suggestion*

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| **CR/TP number** | **CRs/TPs Status update recommendation** |
| XXX | *Based on 1st round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |

## Discussion on 2nd round (if applicable)

*Moderator can provide summary of 2nd round here. Note that recommended decisions on tdocs should be provided in the section titled ”Recommendations for Tdocs”.*

# Recommendations for Tdocs

## 1st round

**New tdocs**

|  |  |  |
| --- | --- | --- |
| **Title** | **Source** | **Comments** |
| WF on … | YYY |  |
| LS on … | ZZZ | To: RAN\_X; Cc: RAN\_Y |
|  |  |  |

**Existing tdocs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation** | **Comments** |
| R4-2104861 | CR for core requirement maintenance on direct SCell activation | Apple |  |  |
| R4-2106388 | Draft CR Correction of activation delay for Direct activated Scell | Nokia, Nokia Shanghai Bell |  |  |
| R4-2106993 | CR on direct SCell activation | Huawei, HiSilicon |  |  |
| R4-2106994 | CR on SCell dormancy requirements | Huawei, HiSilicon |  |  |
| R4-2106884 | Draft Big CR 38.133: Introduction of Rel-16 MR-DC Direct SCell activation and SCell dormancy RRM performance requirements | Ericsson |  |  |
| R4-2106996 | draftCR on SCell dormancy TC | Huawei, HiSilicon |  |  |

Notes:

1. Please include the summary of recommendations for all tdocs across all sub-topics incl. existing and new tdocs.
2. For the Recommendation column please include one of the following:
   1. CRs/TPs: Agreeable, Revised, Merged, Postponed, Not Pursued
   2. Other documents: Agreeable, Revised, Noted
3. For new LS documents, please include information on To/Cc WGs in the comments column
4. Do not include hyper-links in the documents

## 2nd round

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation** | **Comments** |
| R4-210xxxx | CR on … | XXX | Agreeable, Revised, Merged, Postponed, Not Pursued |  |
| R4-210xxxx | WF on … | YYY | Agreeable, Revised, Noted |  |
| R4-210xxxx | LS on … | ZZZ | Agreeable, Revised, Noted |  |
|  |  |  |  |  |