**3GPP TSG RAN WG1 Meeting #101-E R1-2004749**

**e-Meeting, May 25 – June 05, 2020**

**Source: Moderator (Intel Corporation)**

**Title: Summary of email discussions for [101-e-NR-Mob-Enh-03]**

**Agenda item: 7.2.9**

**Document for: Discussion**

# Introduction

In this contribution, we summarize the email discussion approved for discussion during RAN1 #101-E. Chairman has approved three email discussion threads for RAN1 #101-E. The following are the approved email discussions:

* [101-e-NR-Mob-Enh-01] Email discussion/approval of Issue #1 (UL cancellation for DAPS) and #3 (UL overlapping transmission) in R1-2003747 by 5/29; if necessary, endorse the associated TPs by 6/4 – Daewon (Intel)
* [101-e-NR-Mob-Enh-02] Email discussion/approval of Issue #5 (Power sharing mode for UL DAPS-HO) in R1-2003747 by 5/28; if necessary, endorse the associated TPs by 6/3– Daewon (Intel)
* [101-e-NR-Mob-Enh-03] Email discussion/approval of Issue #6 (PDCCH monitoring in DL DAPS-HO) in R1-2003747 by 5/28; if necessary, endorse the associated TPs by 6/2– Daewon (Intel)

This contribution summarizes the email discussion for [101-e-NR-Mob-Enh-03].

# Email Discussion [101-e-NR-Mob-Enh-03]

This discussion is regarding the PDCCH/PDSCH restrictions for DL DAPS-HO (Issue #6 from [11]).

**Issue and Proposal Summary based on [4][5][6][8]:**

Contribution in [4] mentioned that the overbooking rules for DAPS-HO is more stringent than what was agreed in RAN1 #99 and suggests changing the specification to limit the overbooking in the target MCG only. Contribution in [6] clarified on the overbooking rules for source and target. In addition, The PDCCH blind detection for MCG1 and MCG2 capability was decided to be removed since RAN2 decided to not support SCell during DAPS HO. Contribution [4] and [5] suggests removing the corresponding text from specification.

* Text Proposal from [4]:

## TP #1

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| 15 Dual active protocol stack based handover*< Unchanged parts are omitted >*~~The UE can provide~~ *~~pdcch-BlindDetectionMCG1-UE~~* ~~to indicate a capability to monitor a maximum number of PDCCH candidates per slot that corresponds to~~ $N\_{cells}^{target}$ ~~downlink cells for the target MCG and~~ *~~pdcch-BlindDetectionMCG2-UE~~* ~~to indicate a capability monitor a maximum number of PDCCH candidates per slot that corresponds to~~ $N\_{cells}^{source}$ ~~downlink cells for the source MCG.~~ If the UE is provided search space sets on both the target MCG and the source MCG, the UE does not expect to have in any slot any USS set without allocated PDCCH candidates for monitoring on ~~both~~ the target MCG ~~and the source MCG~~. |

* Text Proposal from [5]:

## TP #2

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| For intra-frequency DAPS HO operation, the UE expects that an active DL BWP and an active UL BWP on the target cell are within an active DL BWP and an active UL BWP on the source cell, respectively.~~The UE can provide~~ *~~pdcch-BlindDetectionMCG1-UE~~* ~~to indicate a capability to monitor a maximum number of PDCCH candidates per slot that corresponds to~~ $N\_{cells}^{target}$ ~~downlink cells for the target MCG and~~ *~~pdcch-BlindDetectionMCG2-UE~~* ~~to indicate a capability monitor a maximum number of PDCCH candidates per slot that corresponds to~~ $N\_{cells}^{source}$ ~~downlink cells for the source MCG.~~ If the UE is provided search space sets on both the target MCG and the source MCG, the UE does not expect to have in any slot any USS set without allocated PDCCH candidates for monitoring on both the target MCG and the source MCG. |

* Proposal in [6]
	+ Confirm that the specification related to PDCCH overbooking during DAPS HO implies that overbooking is allowed in source or target.
* Proposal in [8]
	+ Clarify the agreement made in RAN1 meeting #99 and allow overbooking in source MCG during the DAPS HO.

## TP #3

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| The UE can provide *pdcch-BlindDetectionMCG1-UE* to indicate a capability to monitor a maximum number of PDCCH candidates per slot that corresponds to $N\_{cells}^{target}$ downlink cells for the target MCG and *pdcch-BlindDetectionMCG2-UE* to indicate a capability monitor a maximum number of PDCCH candidates per slot that corresponds to $N\_{cells}^{source}$ downlink cells for the source MCG. If the UE is provided search space sets on both the target MCG and the source MCG, the UE does not expect to have in any slot any USS set without allocated PDCCH candidates for monitoring on ~~both~~ the target MCG ~~and the source MCG~~. |

**Discussion Summary:**

There seems to be two issues.

1. Correction of specification text from removal of PDCCH monitoring capability for DAPS.
	* TP #2
2. Issue of overbooking in source MCG during DAPS HO.
	* TP #3

Companies are encouraged to provide comments on the proposal above. Comments should include views on whether TP #2 and TP #3 are acceptable or not. Also, if companies have a modified/reformulated proposal based on proposals from above companies, please do provide them below as well.

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| Company Name | Comments/Views |
| Ericsson | Issue 1: support to endorse TP #2Issue 2: support to endorse TP #3 |
| Huawei, HiSilicon | TP#2 is ok. TP#3 needs more discussion, failed to understand the statement that “the overbooking rules for DAPS-HO is more stringent than what was agreed in RAN1 #99”. The agreement says “the UE is not expected to be provided with PDCCH configuration leading to PDCCH overbooking at both source and target cells”. To my understanding, the current spec correctly reflected not allowing overbooking is either source or target cell. If considering overbooking for one of both, why is it source but not target? |
| Intel | Support TP#2 and TP#3.For TP#3, while the agreement does state it is not expected to perform overbooking, based on our understanding the original intent was to limit the overbooking only in one of the MCG and not limit overbooking in both MCGs. The support of overbooking for PCell is a mandatory feature for the UE, so UE should be able to support overbooking at least in one of the MCGs. |
| Samsung | We support TP#2 and TP#3.For TP#3, our understanding is the agreement means to avoid overbooking configurations for both source and target cell simultaneously. Allowing overbooking in one of the cell is within Rel-15 UE capability. |
| Nokia | Support TP#2 and TP#3.For TP#3, it could be also possible to revise it so that we (instead) add ‘simultaneously’ to end of the sentence, thereby allowing overbooking in one of the MCGs.  |
| ZTE | Support TP#2 and TP#3. |
| MTK | Support TP#2 and TP#3. |
| Apple | Support TP#2.For TP#3, recall the previous discussion, the intention is to avoid the overbooking in both MCG and SCG at the same time. it seems fine that just one of CGs is overbooked. |

**Discussion Summary of all comments received by May 27, 11pm PDT (May 28, 6am UTC):**

TP#2 seems to be agreeable by all companies who have provided input so far. For TP#3, the suggestion from Nokia seems to be a good way forward.

Moderator Suggestion for Agreement:

* Agree TP #2 of R1-2004749
* Agree on revision of TP#3 by adding ‘simultaneously’ at the end. Revised TP available as TP #4 of R1-2004749

## TP #4

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| The UE can provide *pdcch-BlindDetectionMCG1-UE* to indicate a capability to monitor a maximum number of PDCCH candidates per slot that corresponds to $N\_{cells}^{target}$ downlink cells for the target MCG and *pdcch-BlindDetectionMCG2-UE* to indicate a capability monitor a maximum number of PDCCH candidates per slot that corresponds to $N\_{cells}^{source}$ downlink cells for the source MCG. If the UE is provided search space sets on both the target MCG and the source MCG, the UE does not expect to have in any slot any USS set without allocated PDCCH candidates for monitoring on both the target MCG and the source MCG simultaneously. |

**Discussion Summary after May 27, 11pm PDT (May 28, 6am UTC):**

Given that there seems to be wide support for TP#2 and some support for TP#3 (or TP#4), companies are encouraged to provide comments regarding any concerns on the moderator suggestion for agreement above. If no concerns are raised for the above moderator suggestion for agreement, we may ask Chairman to approve TP#2 and TP #4.

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| Company Name | Comments/Views |
| Apple | We support TP#2 and TP#4 |
| Samsung | We support TP#2 and TP#4. |

# Conclusion of the Email Discussion [101-e-NR-Mob-Enh-03]

**Summary of email discussion outcome:**

Agreement:

* Adopt TP#2 and TP#4 in R1-2004749 for Clause 15 of TS 38.213

# Reference

1. R1-2003330, “Remaining issues on NR mobility enhancements in physical layer,” ZTE
2. R1-2003506, “Remaining issues on DAPS-HO,” Huawei, HiSilicon
3. R1-2003676, “Remaining issues on Physical Layer Aspects for DAPS-HO,” MediaTek Inc.
4. R1-2003748, “Corrections to Physical layer aspects of NR mobility enhancement,” Intel Corporation
5. R1-2003890, “Remaining issues for NR Mobility Enhancement,” Samsung
6. R1-2004202, “Remaining issues on mobility enhancements,” Ericsson
7. R1-2004235, “On remaining issues on NR mobility enhancements,” Apple
8. R1-2004580, “Remaining physical layer aspects of dual active protocol stack based HO,” Nokia, Nokia Shanghai Bell
9. R1-2003331, “Discussion on FR2 mobility interruption enhancements,” ZTE
10. R1-2004148, “Remaining PHY aspects for CHO,” Huawei, HiSilicon
11. R1-2003747, “Issue Summary for NR Mobility Enhancements,” Moderator (Intel Corporation)