**3GPP TSG RAN WG1 Meeting #103-e R1-200xxxx**

**e-Meeting, October 26 – November 13, 2020**

**Source: Moderator (Intel Corporation)**

**Title: [103-e-NR-Mob-Enh-02] Discussions Summary #1**

**Agenda item: 7.2.9**

**Document for: Discussion**

# Introduction

In this contribution, we summarize the email reflector discussions for [103-e-NR-Mob-Enh-01]. Chairman has approved the following email discussion:

* [103-e-NR-Mob-Enh-02] Email discussion/approval on the following until 10/29 – Daewon (Intel)
  + Issue#5 in R1-2008871, issue on handling of SUL and DAPS operation

# Recap of issue from R1-2008871

## Issue #5) Handling of SUL and DAPS capability [6]

[6] notes that Based on existing SUL capabilities, it cannot be unambiguously determined whether UE can or cannot support SUL during DAPS HO. Suggest to send an LS to RAN2 to let them know so that they can take this into account.

* Proposal from [6]:
  + RAN1 sends a LS to RAN2 informing that from RAN1 perspective simultaneous operation of SUL and DAPS is not supported in Rel-16.

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| **1. Overall Description:**  RAN1discussed the simultaneous operation of SUL and DAPS and concluded that, in order to limit the UE complexity, RAN1 perspective simultaneous operation of SUL and DAPS is not supported in Rel-16.  **2. Actions:**  **To RAN2:**  **ACTION:** RAN1 respectfully asks RAN2 to take the above information in to account. |

# Summary of Email Discussions

The proposal from [6] suggest sending a LS to RAN2 to inform that simultaneous operation of SUL and DAPS is not supported in Rel-16. This discussion can be split into two separate questions.

**Q1)** Do you agree that simultaneous operation of SUL and DAPS is not supported in Rel-16 from RAN1 perspective?

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| **Company** | **Agree? (Yes/No)** | **Comments for Q1** |
| Qualcomm | Yes with comments | We prefer not to support SUL and DAPS simultaneously (i.e., switching from normal UL to SUL or vice versa together with DAPS HO is not supported). Furthermore, we should further discuss whether UE is configured with switching between SUL and normal UL before DAPS handover if UE indicates support of DAPS. With SUL, we may need to add some clarification to the following spec since it is not clear whether UL BWP is BWP for normal UL or BWP for SUL:  “*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.*” |
| Huawei/HiSi | depends | A clarification is needed before answering this question. Basically similar to what QC comented.  UE can be configured with only NUL or only SUL or both NUL and SUL for dynamic switching between two of them. When we say simultaneous operation of SUL and DAPS in the Q1), which case(s) are we talking about? In our understanding, there is no issue for UE configured with only SUL to co-work with DAPS simultaneously. The only case there is concern from UE implementation is that when UE configured with both NUL and SUL and the target cell is inter-frequecy with both NUL and SUL, and in such a case, we also perfer to not work simultaneously with DAPS. From UE capablity perspective, the existing UE capablity reporting for SUL feature and DAPS is sufficient so no need to change. Also, when UE is configured both SUL and NUL and the target cell is inter-frequency, how to release one UL of source cell when configuring UE with DAPS is the similar issue as to Scell release/multi-TRP fallback being discussed in RAN2. |
| ZTE | Acceptable | For simplicity, SUL and DAPS cannot be configured simultaneously. But we also have the same questions as pointed out by QC and HW. |
| Apple | Yes | No simultaneously operation between SUL and DAPS HO is preferred. Regarding the reconfiguration from SUL to normal UL before the DAPS HO, this can be discussed in RAN2. |
| MTK | Yes | We also agree on QC’s clarification text on BWP and HW/Apple’s suggestion to discuss the remaining details in RAN2. |
| Samsung | Yes with comments | We prefer not to support SUL and DAPS operations simultaneously. We also have the same questions as pointed out by QC and HW. Further clarifications would be better. |
| Nokia | Yes | The main case we felt needs to be addressed is when SUL is configured so that we can dynamically address e.g. PUSCH on either, or we have at least one of PUSCH/PUCCH/SRS/RACH associated to with one of the two UL carriers of the cell while some other UL transmissions are associated with the other UL carrier.  This may be difficult from UE implementation and definition perspective.  For the case, if we assume that e.g. PUSCH, PUCCH, SRS are only configured to SUL, but not to NUL and also RACH carrier selection always results SUL, for target and source respectively, there could be some option to consider joint operation but would require special configuration.  For case e.g. target has SUL and target NUL if we want to support this case, it would be good to clarify the whether case falls to intra- or inter-frequency. RAN4 currently determines the split among these cases from DL perspective (e.g. ”*A DAPS handover is intra-frequency if the centre frequency of the SSB of the source cell and the centre frequency of the SSB of the target cell are the same, and the subcarrier spacing of the two SSBs are also the same*”), but also assumes that the target(/source) UL BWPs need to be confined within source(/target) UL BWP (see below).  Regarding the BWP related clarification proposed by Qualcomm, RAN4 specification has already following definitions:  In Section 6.1.3 (of 38.133):  “the initial DL and UL BWP of source cell is confined within the active DL and UL BWP of the source cell respectively, and the initial DL and UL BWP of target cell is confined within the active DL and UL BWP of the target cell respectively.”  And then in 6.1.3.2:  “Note:       For intra-frequency DAPS handover, no requirement applies if active DL and UL BWP of target cell is not confined within the active DL and UL BWP of the source cell respectively.  Note:         For inter-frequency DAPS handover, no requirement applies if the BWP of target cell is overlaped with the BWP of source cell in frequency domain.” |

**Q2)** If Q1 is agreeable, should we send an LS to RAN2?

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| **Company** | **Send LS (Yes/No)** | **Comments for Q2** |
| Qualcomm |  | We can further discuss whether LS to RAN2 is needed after resolving discussions in Q1) |
| Huawei/HiSi | depends | Depends on the conclusion of Q1). In our opinion, as long as we conclude ”when UE configured with both SUL and NUL and the target cell is inter-freq”, LS can be sent to RAN2 to request them to consider the case of SUL also. However, RAN2 has been tasked to solve the issue for Scell release and m-TRP fallback, the solution (i.e., via RRC reconfiguration or defining default UE behavior) can be applied in principle to SUL as well. From this perspecitve, sending the LS is not necessary. |
| ZTE | Yes | An LS is slightly preferred if Q1 is agreed. |
| Apple | Yes | Sending the LS is preferred. |
| MTK | Yes | Sending the LS is preferred. |
| Samsung |  | Depends on the discussion in Q1. |
| Nokia | Yes | We think LS to RAN2 is needed. |

# Summary of Conclusions

To be filled once agreements/conclusions are made in RAN1.

# Reference

1. R1-2007593, “Remaining issues on DAPS,” Huawei, HiSilicon
2. R1-2007738, “Draft CR on intra-frequency DAPS handover,” ZTE
3. R1-2008144, “Draft CR on clarification of processing capability on DAPS HO dropping timeline,” Samsung
4. R1-2008209, “Correction to DAPS HO,” Ericsson
5. R1-2008502, “Remaining issues on per CC UE capability and UL cancellation for DAPS-HO,” MediaTek Inc.
6. R1-2008733, “Remaining physical layer aspects of dual active protocol stack based HO,” Nokia, Nokia Shanghai Bell
7. R1-2008871, “Pre-meeting Issue Summary for NR Mobility Enhancements,” Moderator (Intel Corporation)