**3GPP TSG RAN WG1 #106-e R1-21xxxxx**

**e-Meeting, August 16th – 27th, 2021**

**Title: Draft reply LS on** **physical layer aspects of small data transmission**

**Response to:** **R2-2106561**

**Release: Rel-17**

**Work Item: NR\_SmallData\_INACTIVE-Core**

**Source:** **RAN1**

**To:** **RAN2**

**Cc:**

**Attachments:**

**Contact Person:**

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**1. Overall Description:**

RAN1 would like to thank RAN2 for the LS on physical layer aspects of small data transmission in R2-2106561.

Regarding RA-SDT, RAN1 discussed the configuration parameters for the PRACH resource configuration when PRACH occasions are shared between SDT and non-SDT and when PRACH occasions are separately configured for SDT and non-SDT. RAN1 made the following agreements/conclusion for RA-SDT.

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| **Proposal 1: For RA-SDT, when PRACH occasions are separate between SDT and non-SDT, the existing PRACH resource configurations can be separately configured, including 4-step RACH and/or 2-step RACH based SDT.**   * ~~E.g. following parameters can be configured~~ * ~~PRACH Configuration Index~~ * ~~Time resources and frequency resources of PRACH resources,~~ * ~~Number of SSBs associated with a valid RO,~~ * ~~Number of contention based preambles per SSB per valid RO,~~ * ~~totalNumberofRA-Preambles~~ * ~~prach-RootSequenceIndex,~~ * ~~zeroCorrelationZoneConfig,~~ * ~~restrictedSetConfig~~ * ~~FFS if separate ROs need to be configured for RA-SDT of both 4-step RACH and 2-step RACH~~   **Proposal 2:** For RA-SDT, when PRACH occasions are shared between SDT and non-SDT, at least following parameters can be configured, including 4-step RACH and/or 2-step RACH based SDT operation.   * Number of contention-based preambles for SDT per SSB per valid RO * ~~Starting position of the preambles for SDT per SSB per valid RO~~ * ~~FFS explicit indication, or implicit determination for preamble for SDT in shared ROs~~   Note: whether starting position of the preambles for SDT per SSB per valid RO needs to be configured for RA-SDT in shared ROs is up to RAN2 discussion.  **Conclusion:** Further discuss on the case when ROs are shared between SDT and non-SDT, but different RACH types have separate ROs after RAN2’s decision   * ~~Ask RAN2 about the possible combinations of RACH type for SDT and non−SDT~~   **Proposal 3: For RA-SDT, when PRACH occasions are shared between SDT and non-SDT, a PRACH mask can be configured to indicate a subset of ROs for RA-SDT.**   * + The PRACH mask is used to indicate a subset of ROs associated with same SSB index for RA-SDT   + ~~The PRACH Mask indexes for 4-step SDT and 2-step SDT should be separately configured.~~   **Proposal 4:** For RA-SDT in shared ROs and separate ROs with non-SDT, the power control parameters follow those for non-SDT,   * i.e. preambleReceivedTargetPower and power ramping setting follow those for non-SDT. |

Regarding the questions for CG-SDT on the working assumption and agreements, RAN1 made the following agreements.

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| Search space is configured for UEs performing CG-SDT  **Proposal 5:** RAN1 confirms the working assumption on search space for CG-SDT.   * UE-specific search space is configured for UEs performing CG-SDT.   BWP for CG-SDT resource  **Proposal 6:** RAN1 confirms the RAN2 agreement that CG-SDT resource can be configured on either initial BWP or separate SDT BWP.   * ~~For TDD if SDT is configured in a separate BWP, the BWP should includes the initial BWP to avoid BWP switching for receiving the SSBs~~   L1 feedback for CG-SDT  **Proposal 7:** RAN1 to further discuss the followings for L1 feedback for CG-SDT   * Option 1: Support explicit L1 feedback for CG-SDT.   + Option 1A: Reuse DFI based mechanism as introduced in Rel-16 NR-U   + Option 1B: Use UL grant scheduling DG-PUSCH with same HARQ process ID as CG-SDT PUSCH * Option 2: Explicit ACK is not supported for CG-SDT. Reuse Rel-15 CG re-transmission for CG-SDT |

**2. Actions:**

RAN1 respectfully asks RAN2 to take into account the above information.

**3. Date of Next RAN1 Meetings:**

TSG-RAN WG1 Meeting #106b-e 11th Oct – 19th Oct 2021 e-meeting

TSG-RAN WG1 Meeting #107-e 11th Nov – 19th Nov 2021 e-meeting