**3GPP TSG-RAN WG2 #109e R2-2002204**

**Elbonia, 24th February – 6th March, 2020**

**Title:** LS to RAN1 on preamble-to-PRU mapping for 2-step CFRA

**Release:** Rel-16

**Work Item:** NR\_2step\_RACH-Core

**Source:** RAN2

**To:** RAN1

**Contact Person:**

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**1. Overall Description:**

During the RAN2#109e meeting, RAN2 took the following agreements on the signaling of CFRA:

**Agreements**

**For 2-step CFRA**

1 Support dedicated msgA PUSCH resources, i.e non-shared msgA PUSCH resources between CFRA and CBRA.

2 For dedicated msgA PUSCH resources, the full msgA PUSCH configuration is signaled in RACH-ConfigDedicated

3 Dedicated msgA PRACH occasions are optionally configured for 2-step CFRA. If not configured, msgA PRACH occasions for 2-step CBRA are used.

The remaining issue for CFRA after these agreements was identified as part of the open issue summary on Control Plane [1]. The remaining issue is the preamble-to-PRU mapping for CFRA and how to map a preamble (for the case of CFRA and CBRA having shared RO, i.e the UE is given dedicated preamble(s) to be used in the same RACH occasion(s) as for CBRA) to a dedicated CFRA msgA PUSCH resource. Currently RAN2 have discussed two alternatives for mapping:

**Alt 1:** Reusing the preamble-to-PRU mapping rule defined by RAN1 used for CBRA and signaling the number of preambles(field *msgA-TotalNumberOfCFRA*) and an offset to be used for the start of the preamble in each SSB/CSI-RS RACH occasion(field *msgA-PreambleStartIndex*)[2].

**Alt 2:** Not using the preamble-to-PRU mapping but defining an index pointing to the PRU within the dedicated PUSCH occasion in each SSB/CSI-RS(field *pusch-OccasionIndex*)[3]. This index is defined by increasing order of frequency resource index, time resources, and indices for PUSCH slots corresponding to a PRACH slot.

It is clear from the discussions on these two alternatives that both may either require assistance from RAN1 or may have RAN1 specification impact. Among the companies in RAN2 the support for alternative 1 is a lot larger due to it being estimated that the RAN1 impacts will be smaller, thus we expect RAN1 to first consider alternative 1.

For CFRA, RAN2 is asking RAN1 to take the alternatives into considerations and to implement the solution for CFRA preamble-to-PRU mapping that have the least impact and respond to RAN2 on the required signaling in order for the UE to successfully identify a PRU based on a dedicated preamble in respective SSB(s)/CSI-RS(s).

**2. Actions:**

**To RAN1:**

**ACTION:** RAN2 respectfully ask RAN1 to take the above considerations when specifying the preamble-to-PRU mapping and reply to RAN2 on the required signaling to identify a PRU in a dedicated PUSCH occasion.

**3. Date of Next TSG-RAN WG2 Meetings:**

RAN-WG2 Meeting #109bis Sapporo, Japan 20-24 April, 2020

RAN-WG2 Meeting #110 Athens, Greece 25-29 May, 2020

RAN-WG2 Meeting #111 Toulouse, France 24-28 Aug, 2020

**4. References**

[1] R2-2001917, Summary of CP open issues, Ericsson, RAN2#109e

[2] R2-2000998, Resource configuration for 2-step CFRA, ZTE, RAN#109e

[3] R2-2000224, PUSCH Resource Configuration for 2 step CFRA, Samsung, RAN2#109e