**3GPP TSG RAN WG1 Meeting #107-e** **R1-211xxxx**

**Nov 11th – Nov 19th, 2021**

**Agenda item: 8.2**

**Source: Rapporteur (Qualcomm Incorporated)**

**Title: Comments collection for RRC parameters for extending NR to 52.6-71GHz**

**Document for: Discussion and Decision**

# Introduction

This paper is a place holder to collect comments for RRC parameters for 60GHz work item. The RRC parameters are captured in the excel sheet in the same folder.

# Comments

## Initial access aspects

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| Company | View |
| Samsung | Just one minor comment: Row 2 and Row 3 should also be “depends on locations” for column N, since SubcarrierSpacing-r17 can be either cell-specific or UE-specific depending on which IE includes such parameter.  |
| LG Electronics | Please add a new row for ssb-PositionsInBurst, according to the following RAN1 conclusion and agreement. For the agreement, at least yellow highlighted part should be captured in the comment column.**Conclusion*** The bit-width of ssb-PositionsInBurst in SIB1 and ServingCellConfigCommon is kept the same as in Rel-15 (i.e., 16-bits in SIB1 and 64-bits in ServingCellConfigCommon).

**Agreement*** If $N\_{SSB}^{QCL}$ is indicated, the same interpretation of ssb-PositionsInBurst in SIB1 or ServingCellConfigCommon as in Rel-16 is supported, i.e.:
	+ A bit set to 1 at position $k\in \{1..64\}$ indicates SS/PBCH block index k-1
	+ The UE assumes that a bit at position k > $N\_{SSB}^{QCL}$ is set to 0
		- For ssb-PositionsInBurst in SIB1, the UE assumes that a bit at *groupPresence* corresponding to a SS/PBCH block index ≥ $N\_{SSB}^{QCL}$ is set to 0
	+ Note: for ssb-PositionsInBurst in SIB1, position k corresponds to the SS/PBCH block index indicated by a bit in inOneGroup and a bit in groupPresence
* In operation with shared spectrum in 60 GHz, for ssb-PositionsInBurst in ServingCellConfigCommonSIB,
	+ for MSB k, k≥1, of inOneGroup and MSB m, m≥1, of groupPresense of ssb-PositionsInBurst:
		- if MSB k of inOneGroup and MSB m of groupPresense are set to 1, the UE assumes that SSB(s) within DBTW with ‘candidate SSB index(es)’ corresponding to ‘SSB index’ equal to k-1+(m-1)×8 may be transmitted;
		- if MSB k of inOneGroup or MSB m of groupPresense is set to 0, the UE assumes that SSB(s) within DBTW with ‘candidate SSB index(es)’ corresponding to ‘SSB index’ equal to k-1+(m-1)×8 is not transmitted;
* In operation with shared spectrum in 60 GHz, for ssb-PositionsInBurst in ServingCellConfigCommon,
	+ ssb-PositionsInBurst bits correspond to supported ‘SSB indices’,
		- and UE assumes that SSB(s) within DBTW with ‘candidate SSB index(es)’ corresponding to indicated bit(s) may be transmitted;
		- and UE assumes that SSB(s) within DBTW with ‘candidate SSB index(es)’ corresponding to not indicated bit(s) are not transmitted
* Note to spec editor: The above three bullets maintain the same behavior as Rel-16 NR-U
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| Huawei, HiSilicon | **Row 10 (SSB-PositionQCL-Relation-r17)****Column P:** Suggest the following change:~~Potential Agreement~~~~Proposal 1.1-4F~~Agreement Same N\_{SSB}^{QCL} values using the same set of signaling bits are supported for 120, 480, and 960 kHz. Supported values of N\_{SSB}^{QCL}: {16, 32, 64} Note: For operation with shared spectrum channel access, any supported value of N\_{SSB}^{QCL} can be indicated and value < 64 indicates DBTW enabled UE is expected to be configured with N\_{SSB}^{QCL}=64 in licensed operations For operation with and without shared spectrum channel access, N\_{SSB}^{QCL}=64 indicates that the SS/PBCH block index and the candidate SS/PBCH block index have a one-to-one mapping relationship.**Row 12 (discoveryBurstWindowLength-r17)****Column P:** Add the following WA regarding DBTW for 120 kHz (surprisingly, while we agreed on DBTW support for 480 and 960 kHz, we forgot to confirm the WA regarding the DBTW support for 120 kHz). Working assumption:Support DBTW for 120 kHz.* FFS: Support for 480 kHz and 960 kHz

**New Row for ssb-PositionsInBurst**We second above LG comment. The field description of *ssb-PositionsInBurst* in both *ServingCellConfigCommon* and *ServingCellConfigCommonSIB* for operation with shared spectrum in FR2-2 should be updated according to the agreement mentioned by LG. We suggest to mention both the conclusion and the whole agreement in the comment section. This provides RAN2 with all the relevant information to update the field description however they deem appropriate. |
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## PDCCH monitoring enhancements

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| Company | View |
| Samsung | For Row 14, it’s better to copy the whole agreement from RAN1 in Column P. Understand the agreement is long, but it’s better to keep the original agreement for consistency and more accurate information delivery to RAN2.  |
| Intel | Row 14, multiSlotMonitoring-OptionalCombinations is a capability and belongs in the UE feature list not in RRC list. Suggest removing this from the RRC list. |

## Enhancements for PUCCH formats 0/1/4

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## Beam management for new SCSs

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## PDSCH/PUSCH enhancements

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| vivo | There was one agreement (copied below) we made in last meeting not captured into RRC parameter list of RAN1#106bis-e yet.Agreement:For NR operation with 480 kHz and/or 960 kHz SCS, the value range of k1 indicated in RRC is -1 ~ 127 for DCI format 1\_1 and 0 ~ 127 for DCI format 1\_2.Comment 1:Need to add new IE or extend range of existing IE (up to RAN2) and the value range of *DL-DataToUL-ACK-r17* inside *PUCCH-Config* is (-1 .. 127) applicable to 480 and 960 kHzComment 2:Need to add new IE or extend range of existing IE (up to RAN2) and the value range of *DL-DataToUL-ACK-DCI-1-2-r17* inside *PUCCH-Config* is (0 .. 127) applicable to 480 and 960 kHz |
| DOCOMO | Based on the latest status in this meeting, a new RRC parameter for time domain bundling for Type 1 HARQ-ACK CB needs to be introduced.**Agreement**For multi-PDSCH scheduling with a single DCI* Introduce a new RRC parameter, e.g., *enableTimeDomainHARQ-Bundling*, to enable time domain bundling operation for type-1 HARQ-ACK codebook per serving cell.
	+ If the RRC parameter enables time domain bundling operation,
		- To determine the set of candidate PDSCH reception occasions,
			* A row index is removed if at least one symbol of every PDSCH associated with the row index is configured as semi-static UL. (NOTE: This is similar to the case of slot aggregated PDSCH in Rel-16)
			* Pruning procedure in Rel-16 is performed based on the last configured SLIV of each row index.
		- Logical AND operation is applied across all valid PDSCHs associated with a determined candidate PDSCH reception occasion, at least for 1-TB case.
		- FFS: UE does not expect the last scheduled SLIV overlaps with a semi-static UL symbol when parameter *enableTimeDomainHARQ-Bundling* is configured
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| Intel | Agree with DoCoMo that the RRC parameter *enableTimeDomainHARQ-Bundling* should be captured for Type-1 codebook. Further, there is another RRC parameter *numberOfHARQ-BundlingGroups* that is agreed for Type2 codebook. **Agreement**For multi-PDSCH scheduling with a single DCI* Introduce a new RRC parameter, e.g., *numberOfHARQ-BundlingGroups*, to configure the number of HARQ bundling groups with value range {1, 2, 4} for type-2 HARQ-ACK codebook per serving cell.
	+ …
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| LG Electronics | The first main bullet needs to be added for PDSCH-TimeDomainResourceAllocationListForMultiPDSCH-r17, i.e., comment column in row 30. And the second main bullet needs to be added for PUSCH-TimeDomainResourceAllocationListForMultiPUSCH-r17, i.e., comment column in row 29.**Agreement*** If a UE is configured with a TDRA table in which one or more rows contain multiple SLIVs for PDSCH for DCI format 1\_1, the UE does not expect to be configured with *repetitionNumber* for the TDRA table, and if *pdsch-AggregationFactor* is configued in *PDSCH-config*, it does not apply to DCI format 1\_1.
	+ Note: *repetitionNumber* cannot be configured with *pdsch-TimeDomainAllocationListDCI-1-2* as in Rel-16.
	+ Note: Under agenda item 8.2.4, in RAN1#106-bis, it was already agreed that within the TDRA table for multi-PDSCH scheduling, the UE does not expect to be configured with the higher layer parameter *repetitionNumber*.
	+ Note: These does not preclude *pdsch-AggregationFactor* can be configured and applies to DCI format 1\_2
* If a UE is configured with a TDRA table in which one or more rows contain multiple SLIVs for PUSCH for DCI format 0\_1, the UE does not expect to be configured with *numberOfRepetitions* for the TDRA table, and if *pusch-AggregationFactor* is configued in *PUSCH-config*, it does not apply to DCI format 0\_1.
	+ Note: These does not preclude *numberOfRepetitions* is configured for TDRA table corresponding to DCI format 0\_2
	+ Note: These does not preclude *pusch-AggregationFactor* can be configured and applies to DCI format 0\_2
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## Channel access mechanism

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| Qualcomm | Given the following agreement:**Agreement**For Non-Fallback DCI formats, for FR2-2 operation, for the configuration of the ChannelAccess-CPext field in DCI to indicate the channel access type only, new tables are introduced indicating channel access types for FR2-2, with entries “Type 1 channel access in 4.4.1 of 37.213”, “Type 2 channel access in 4.4.2 of 37.213” and “Type 3 channel access in 4.4.3 of 37.213”.For existing IE UL-AccessConfigListDCI-0-1-r16 and UL-AccessConfigListDCI-1-1-r16, we will need to change the range for them to SEQUENCE (SIZE (1..3)) OF INTEGER (0..2) |
| DOCOMO | We agree with Qualcomm. Maybe IE UL-AccessConfigListDCI-0-1-r17 and UL-AccessConfigListDCI-1-1-r17 can be define with SEQUENCE (SIZE (1..3)) OF INTEGER (0..2), which we also believe is up to RAN2.  |
| LG Electronics | The following agreement needs to be reflected.**Agreement**For CG-PUSCH to DL COT sharing, extend the duration and offset range to {1, …, 319}. |
| Huawei, HiSilicon | **Row 42 and 43 Column P:**Comment section correctly reflects the agreement: **“**For regions where LBT is not mandated, gNB should indicate to the UE this gNB-UE connection is operating in LBT mode or no-LBT mode….” However, even in the regions that LBT is mandated, LBT/No-LBT mode should be indicated: If UE operates in an unlicensed band where LBT is mandated and LBT mode is not indicated to the UE, cannot know how to interpret the 2 bits of ChannelAcess in DCI (whether they are reserved or channel access indication).We suggest the following addition to column P:Agreement:For regions where LBT is not mandated, gNB should indicate to the UE this gNB-UE connection is operating in LBT mode or no-LBT mode• Support both cell specific (common for all UEs in a cell as part of system information or dedicated RRC signalling or both) and UE specific (can be different for different UEs in a cell as part of UE-specific RRC configuration) gNB indication Note: “this gNB-UE connection is operating in LBT mode” should also be indicated to the UE in regions where LBT is mandated. **New Row for CG-COT-Sharing-r17**Agree with above LG comment. Since duration and offset of CG-COT-Sharing-r16 are not extendable and, moreover, channelAccessPriority-r16 in CG-COT-Sharing-r16 is not optional, it seems that introducing a new parameter CG-COT-Sharing-r17 cannot be avoided. |

## Others

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