3GPP TSG RAN WG1 Meeting #108-e R1-22xxxxx

21st February – 3rd March 2022

Agenda Item: 8.10

Source: Moderator (Qualcomm Incorporated)

Title: Summary of [108-e-R17-RRC-eIAB] Email discussion on Rel-17 RRC parameters for eIAB

Document for: Discussion and decision

This document provides a summary of the following email discussion on RRC parameters to support eIAB physical layer operation:

[108-e-R17-RRC-eIAB] Email discussion on Rel-17 RRC parameters for eIAB – Luca (Qualcomm)

* 1st check point for first LS in [108-e-R17-RRC]: February 24
* Final check point for second LS in [108-e-R17-RRC] if necessary: March 3

The starting point from the discussion is largely based on the outcome of the related discussion in RAN1#107-e, reflected in [1]. Since the scope of this thread is constrained to RRC parameters only, only the RRC related input has been extracted from [1]. Additional input was provided in [2]. Track changes was enabled to highlight the modifications from [1] for parameters within the scope of this discussion.

The input to the next round of consolidated RRC thread [108-e-R17-RRC] will be updated to reflect the starting point provided in this document and will be subsequently updated based on the progress from this discussion, as needed.

The plan is to continue this WI specific discussion using this format. Once completed, the output of this discussion will be folded into the LSs under [108-e-R17-RRC] as well as into a consolidated eIAB LS to RAN2 and RAN3 with all eIAB upper layer parameters (RRC, MAC-CE and F1AP), which will merge in the output from the related email discussion [108-e-R17-eIAB-03].

| **Param. ID** | **Sub-feature group** | **New or existing parameter** | **Parameter name in specification** | **Description** | **Value range** | **Default value** | **IAB node specific/IAB nodes common** | **Specification** | **Signaling** | **Comment** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| P24 | Resource multiplexing | New | *AvailabilityCombinationsPerCell-r17* | Indicates availability for the soft resources of the respective RB sets corresponding to a given time resource of the child IAB-DU cell.It has the same structure as “*AvailabilityCombinationsPerCell-r16”,* except for:1. Replace *AvailabilityCombinations-r16* with *AvailabilityCombinations-r17*
2. Replace *AvailabilityCombination-r16* with *AvailabilityCombination-r17*
3. Add *RBSetGroup,*
 |  |  | IAB node specific |  | **RRC** | **RAN1 #106bis-e****Agreement**A single DCI format 2\_5 can be received indicating availability for the soft resources of the respective RB sets corresponding to a given time resource of the child IAB-DU cell.* FFS: Extension of *AvailabiltyCombination* to include multiple RB sets in a *resourceAvailabilty* indication
* FFS: Update*resourceAvailability* mapping table defined in TS38.213 so that the indication of availability can be applied over soft resources in frequency-domain for DL or UL or Flexible symbols.
* FFS: Need for extension of the maximum payload size of DCI format 2\_5 to increase the number of IAB-DU cells that can be provided with availability information for Soft resources to accommodate the maximum number of possible RB sets for a given DU cell (if defined), or other backwards compatible signaling extensions in case the principal indication capabilities of DCI format 2\_5 are increased.

**RAN1 #107-e****Agreement:** For DCI format 2\_5 indicating availability for the soft resources of the respective RB sets corresponding to a given time resource of the child IAB-DU cell:* *AvailabiltyCombination* can be extended to include multiple *resourceAvailabilty*, where each *resourceAvailabilty* includes availability indication for one RB set group
	+ One RB set group consists of one or multiple RB sets

**RAN1 #108-e****Agreement:** Enhance the RRC signaling for the configuration of DCI Format 2\_5 to include the configuration of availability indication for soft resources in multiple  RB set groups by introducing the following new RRC parameters:* *AvailabilityCombination-Rel17*to include multiple *resourceAvailaibity-Rel17* indications, where each *resourceAvailaibity-Rel17*indicates the availability of soft resources in one or multiple slots for each configured RB set group in sequence.
* The RB set groups are configured for all *availabilityCombinationId(s)* with the following parameters and are applied over each slot:
	+ Number of RB set groups.
		- FFS: max value
	+ Number of RB sets for each group.
		- FFS: max value
* If an RB set group is not provided, only one *resourceAvailablity-Rel17* is included in *AvailabilityCombination-Rel17* to indicate availability of soft resources in one or multiple slots for all RB sets of a DU cell.
 |
| P28 |  |  | *AvailabilityCombination-Rel17* | Indicates availability of soft resources for one or more RB set groups for one combination of slots of an IAB-DU cell.It has same structure as “*AvailabilityCombination-r16”* except for * It includes one or more *resourceAvailaibity-Rel17*, each per RB set group in sequence.
 |  |  |  |  |  | **RAN1 #108-e****Agreement:** Enhance the RRC signaling for the configuration of DCI Format 2\_5 to include the configuration of availability indication for soft resources in multiple  RB set groups by introducing the following new RRC parameters:* *AvailabilityCombination-Rel17*to include multiple *resourceAvailaibity-Rel17* indications, where each *resourceAvailaibity-Rel17*indicates the availability of soft resources in one or multiple slots for each configured RB set group in sequence.
* The RB set groups are configured for all *availabilityCombinationId(s)* with the following parameters and are applied over each slot:
	+ Number of RB set groups.
		- FFS: max value
	+ Number of RB sets for each group.
		- FFS: max value
* If an RB set group is not provided, only one *resourceAvailablity-Rel17* is included in *AvailabilityCombination-Rel17* to indicate availability of soft resources in one or multiple slots for all RB sets of a DU cell.
 |
| P29 |  |  | *resourceAvailaibity-Rel17* | It has the same format as “*AvailabilityCombination-r16”* except that the indication is applied to a RB set group.  |  |  |  |  |  | **RAN1 #108-e****Agreement:** Enhance the RRC signaling for the configuration of DCI Format 2\_5 to include the configuration of availability indication for soft resources in multiple  RB set groups by introducing the following new RRC parameters:* *AvailabilityCombination-Rel17*to include multiple *resourceAvailaibity-Rel17* indications, where each *resourceAvailaibity-Rel17*indicates the R30R30availability of soft resources in one or multiple slots for each configured RB set group in sequence.
* The RB set groups are configured for all *availabilityCombinationId(s)* with the following parameters and are applied over each slot:
	+ Number of RB set groups.
		- FFS: max value
	+ Number of RB sets for each group.
		- FFS: max value
* If an RB set group is not provided, only one *resourceAvailablity-Rel17* is included in *AvailabilityCombination-Rel17* to indicate availability of soft resources in one or multiple slots for all RB sets of a DU cell.
 |
| P30 | Resource multiplexing | New | *RBSetGroup* | The RB set groups are configured in a*vailabilityCombinationsPerCell-r17*  for all *availabilityCombinationId(s)*  with the following parameters* Number of RB set groups.
* Number of RB sets for each group. Each group includes consecutive RB sets.
 |  |  | IAB node specfic |  | **RRC** | **RAN1 #108-e****Agreement:** Enhance the RRC signaling for the configuration of DCI Format 2\_5 to include the configuration of availability indication for soft resources in multiple  RB set groups by introducing the following new RRC parameters:* *AvailabilityCombination-Rel17*to include multiple *resourceAvailaibity-Rel17* indications, where each *resourceAvailaibity-Rel17*indicates the availability of soft resources in one or multiple slots for each configured RB set group in sequence.
* The RB set groups are configured for all *availabilityCombinationId(s)* with the following parameters and are applied over each slot:
	+ Number of RB set groups.
		- FFS: max value
	+ Number of RB sets for each group.
		- FFS: max value
* If an RB set group is not provided, only one *resourceAvailablity-Rel17* is included in *AvailabilityCombination-Rel17* to indicate availability of soft resources in one or multiple slots for all RB sets of a DU cell.
 |
| P31 | Resource multiplexing | New | directionalCollisionHandling-r17 | This parameter is an extension of directionalCollisionHandling-r16 from CA to NR-DC.Update the description of this parameter in TS38.331:“Indicates that this serving cell is using directional collision handling between a reference and other cell(s) for half-duplex operation in TDD CA with same SCS or in **TDD NR-DC with same SCS within same cell group or cross different cell groups.**”  | {Enable, disable} |  | IAB node specific |  | **RRC** | **RAN1 #108-e****Agreement:** In order to support the agreed extension of CA TDD conflict resolution rules to IAB nodes operating under NR-DC in Rel-17 (covering both inter-donor and intra-donor NR-DC scenarios)* Introduce new RRC parameter: *directionalCollisionHandling-r17*
* Update parameter description for *half-duplexTDD-CA-SameSCS-r16* in TS38.306 to make it clear that it is applicable for NR-DC for IAB-MT. E.g. “if this field is included in *ca-ParametersNR-forDC-v1610 for IAB-MT,*it indicates IAB-MT ~~UE~~supports directional collision handling between reference and other cells for half-duplex operation in TDD NR-DC with same SCS across MCG and SCG”
 |
| P32 | Resource multiplexing | Existing | *half-DuplexTDD-CA-SameSCS-r16* | Reuse existing CA parameter *half-DuplexTDD-CA-SameSCS-r16* to indicate capability for NR-DC by utilizing existing signaling framework via ca-parameterNR-forDC.. Update the description of this parameter in TS38.306 to make it clear that it is applicable for NR-DC. Add the following sentence in the description: “***if this field is included in ca-ParametersNR-forDC-v1610 for IAB-MT, it indicates IAB-MT supports directional collision handling between reference and other cells for half-duplex operation in TDD NR-DC with same SCS across MCG and SCG***” |  |  | IAB node specific |  | **RRC** | **RAN1 #108-e****Agreement:** In order to support the agreed extension of CA TDD conflict resolution rules to IAB nodes operating under NR-DC in Rel-17 (covering both inter-donor and intra-donor NR-DC scenarios)* Introduce new RRC parameter: *directionalCollisionHandling-r17*
* Update parameter description for *half-duplexTDD-CA-SameSCS-r16* in TS38.306 to make it clear that it is applicable for NR-DC for IAB-MT. E.g. “if this field is included in *ca-ParametersNR-forDC-v1610 for IAB-MT,*it indicates IAB-MT ~~UE~~supports directional collision handling between reference and other cells for half-duplex operation in TDD NR-DC with same SCS across MCG and SCG”
 |

NOTE: the Parameter ID field is an arbitrary field that was added to facilitate referencing a particular row in the parameters table when commenting.

Companies are encouraged to provide feedback on the above, in the following table:

|  |  |
| --- | --- |
| Company | Comments |
| Ericsson | **Support in general** but more clarification may be needed regarding how *AvailabilityCombinationsPerCell-r17* will support both TDM and FDM availability combinations. We expect such discussions to take place in A.I. 8.10.1. |
| ZTE, Sanechips | Agree in principle, and further clarification and discussion on the details of RB set group is needed in 8.10.1 for this parameter. |
| Ericsson 2 | P29 *resourceAvailaibity-Rel17* “It has the same format as “*~~AvailabilityCombination-r16~~ resourceAvailability-rel16”* except that the indication is applied to a RB set group. “ |

The table has been updated according to the moderator’s understanding of the most recent agreements. The moderator acknowledges and agrees with the comments from Ericsson and ZTE.

References

[1] R1-2112966 – Summary of [107-e-R17-RRC-eIAB] Email discussion on Rel-17 higher layer parameters (RRC, MAC-CE, and F1AP) for eIAB – Moderator (Qualcomm)

[2] R1-2202404– Higher layer parameters (RRC, MAC-CE, F1AP, XnAp) for enhanced IAB – Ericsson