**3GPP TSG-RAN WG1 Meeting #106-eR1-210XXXX**

e-Meeting, August 16th – 27th, 2021

**Agenda item: 8.3**

**Source: Moderator (Nokia)**

**Title: [Post-106-e-Rel17-RRC-03] Enhanced IIoT and URLLC**

**Document for: Discussion and Decision**

# Introduction

As per chairman’s guidance, the email discussion

* [Post-106-e-Rel17-RRC-03] Enhanced IIoT and URLLC

is planned according to the following guidelines:

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| *As announced during RAN1#106-e, there will be a number of email threads on Rel-17 RRC parameters. For each Rel-17 work item, the work item rapporteur will kick off the email thread. The email discussions on RRC parameters will start from September 1 until September 10 (of course excluding the weekend). The purpose of these email discussions is to initiate our preparations to send the first LS to RAN2 on Rel-17 RRC parameters in October (e.g. tabulate agreed RRC parameters so far and identify ones that RAN1 should discuss whether or not to define).**Please note that RAN1 will NOT be making any decision with regards to the Rel-17 RRC parameters during the email discussions. Intention is to have the work item rapporteurs provide their initial assessment and collect company views if there are any. I am hoping that this discussion will help companies better prepare for RAN1#106bis-e. For each email thread, the rapporteur is to provide a tdoc collecting company views along with a draft list of RRC parameter at the end of the email discussion.* |

This document is there to support the RAN1 email discussion on the RRC parameter list for the Rel-17 URLLC/IIoT WI. Companies are encouraged to provide their comments on the latest version of the RRC parameter sheet in the respective AI specific drafts folder and the changes to the RRC parameter sheet will only be done by the AI moderator based on the received comments in each round or iteration of email discussions on this issue.

**This document is structured as follows:**

* Section 2 contains the email discussion for HARQ-ACK enhancements (AI 8.3.1.1)
* Section 3 contains the email discussion for CSI enhancements (AI 8.3.1.2)
* Section 4 contains the email discussion for NR-U enhancements (AI 8.3.2)
* Section 5 contains the email discussion for Intra-UE periodization enhancements (AI 8.3.3)
* Section 6 contains the email discussion for Other / Propagation delay compensation (AI 8.3.4)

# HARQ-ACK enhancements (AI 8.3.1.1)

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# CSI enhancements (AI 8.3.1.2)

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# NR-U enhancements (AI 8.3.2)

* 1. Channel occupancy initiated by UE

The RRC parameter ‘ue-SemiStaticChannelAccessConfig’ that includes periodicity and offset of periodic channel occupancy initiated by UE is introduced to enable UE-initiated COT inRel-17. The parameter is UE-specific and configured per cell. More details are provided in the Excel sheet where the main descriptions are shown below:

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| --- | --- | --- |
| **Parameter name in the spec** | **Description** | **Value range** |
| ue-SemiStaticChannelAccessConfig | The configuration is conditional on presence of *SemiStaticChannelAccessConfig-r16*. If *SemiStaticChannelAccessConfig-r16* is absent, this configuration is ignored. When the configuration is applicable, the UE operates in semi-static channel access mode and can initiate a channel occupancy periodically as described in TS37.213 [Clause x.x]. | (ue-Period, ue-Offset) |
| ue-Period | Added in ue-SemiStaticChannelAccessConfig. ue-Period is the period of a channel occupancy that the UE can initiate as described in TS37.213 [Clause x.x]. ue-Period can be configured independently from *period* configured in *SemiStaticChannelAccessConfig-r16* if the UE indicates the corresponding capability. Otherwise, ue-Period shall be confiugred with a value that is the same, or integer multiple of, or inter factor of the value configred for *period* in *SemiStaticChannelAccessConfig-r16*. | {1ms, 2ms, 2.5ms, 4ms, 5ms, 10ms} |
| ue-Offset | Added in ue-SemiStaticChannelAccessConfig. ue-Offset is the number of symbols from the beginning of the closest even indexed radio frame to the start of the first period that the UE can initiate a channel occupancy as described in TS37.213 [Clause x.x]. The maximum ue-Offset value is 279, 559 and 1119 symbols for 15, 30 and 60 kHz subcarrier spacing, respectively. | INTEGER(0..1119) |

### 1st Round

Please review the description of the RRC parameter ‘ue-SemiStaticChannelAccessConfig’ in the Excel sheet and provide your comments, if any in the table below.

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| --- | --- |
| *Company* | *Comments* |
| Lenovo, Motorola Mobility | Thanks for providing the RRC list.1. Should it be mentioned ‘ue-SemiStaticChannelAccessConfig’ is configured for FR1 only?
2. For ue-Offset, maybe we should clarify:

” ue-Offset is the number of symbols ~~from~~ between the beginning of the closest even indexed radio frame prior to the start of the first period that the UE can initiate a channel occupancy and the start of the first period “We understand there are ”from”, and ”to” in the current definition, but we think a clarification could help avoiding any confusion on whether the closest even indexed radio frame is before/after the start of the first period. |
| Intel | Many thanks for providing the RRC list. We also have similar comments as Lenovo/Motorola regarding the description of ue-Offset, and we are OK with the suggested text: given the offset value should be always positive, the term “prior” should be included within the description of “ue-Offset”. |
| ZTE | Thanks for providing the RRC list.We have the following comments:1. For these parameter names, we think the parameter ue-SemiStaticChannelAccessConfig may need to add the suffix “-r17”, which is similar to SemiStaticChannelAccessConfig-r16 in Rel-16.
2. Given that maximum ue-Period is 10ms, according to the highlighted part in the agreement below, the maximum ue-Offset value should be 139, 279 and 559 symbols for 15, 30 and 60 kHz subcarrier spacing, respectively. The comment part in excel document “1120 is the maximum number of symbols in two radio frames with 60 kHz subcarrier spacing.” may need to be revised to avoid confusion.

Agreement:* In semi-static channel access mode:
* An FFP period for UE-initiated COT is configured as the same, integer multiple of, or inter-factor of the FFP period configured for gNB-initiated COT
* FFP period for UE-initiated COT can be configured independently from FFP period of gNB-initiated COT, if the UE indicates the corresponding capability
* FFP offset for UE-initiated COT is the starting point of first UE FFP relative to the radio frame X boundary.
	+ The offset value range is 0 ≤ offset ＜FFP period of UE-initiated COT
		- FFS on X (e.g. X=0, or X= even index number)
1. There are some typos in description of ue-Period, e.g. “confiugred” and “configred” should be changed to “configured”
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1. Intra-UE multiplexing & priorization enh. (AI 8.3.3)

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1. Propagation delay compensation (AI 8.3.4)

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