**3GPP TSG-RAN WG2 Meeting #109bis electronic *R2-20xxxxx***

20 April – 30 April 2020

**Agenda item: 6.22.2**

**Source: Huawei, HiSilicon**

**Title: Summary of RRC L1 Configurations for eURLLC**

**Document for: Discussion and Decision**

# 1 Introduction

This document is used to collect the feedback on the RRC L1 configurations for the following email discussion for eURLLC.

* [AT109bis-e][057][URLLC] RRC L1 Configuration (Huawei)

Scope: Treat papers under 6.22.2,

Wanted outcome: Agreed-in-principle RRC CR,

Deadline: April 29 0700 UTC (rapporteur may introduce intermediate deadline if needed)

As confirmed with the NR ASN.1 rapporteur, we would like to take this opportunity to handle the eURLLC specific ASN.1 issues relevant to URLLC in this email discussion as well. The summary will be presented based on the outcome of the email discussion.

# 2 Discussion

A format similar to the one used in ASN.1 discussion was used. The guidelines for reporting issues are as follows:

**[Issue #]**: R + 3 digits

**[Class]**: Shall be set to value 0,1 2 or 3.

1. **Trivial** e.g. editorials, commas, colon, misspelling, missing/ double spaces, italics etc.
See procedure for Class 0 and Class 1 issues below.
2. **Minor** e.g. quite straightforward changes e.g. correction/ addition of specification references or sub-clauses.
See procedure for Class 0 and Class 1 issues below.
3. **ASN.1 session** **issue** e.g. ASN.1 issue e.g. related to need codes, extensibility, alternative encoding, ASN.1/ guidelines, general protocol (consistency) issue or issue affecting more than one WI
4. **WI session issue i**.e. an issue that is not purely ASN.1 but has some impact on functionality but only affecting a single WI.

## 2.1 Updates to eURLLC L1 configurations from RAN1#100e

In this subsection, as the rapporteur, we sort all the updates to eURLLC L1 configurations from RAN1#100e based on contributions [1-4].

* For issues marked by Agreed, the rapporteur think they are straightforward following RAN1 updates and no further discussion is expected.
* For issues marked by Pending, the rapporteur think they are relevant to the on-going discussions, so we can wait for more outputs and discuss at a later stage.
* For issues marked by ToDiscuss, companies are encouraged to provide comments directly in the column of “Proposed Status” for each issue for the sake of easy reading and tracking. For instance, you can comment like this for each Issue ToDiscuss.

| **Proposed Status** |
| --- |
| ToDiscuss. **Rapporteur:** [COMPANY]: Comments… |

| **Issue**  | **Company** | **Subclause** | **IE name** | **Class** | **Description/correction** | **Proposed Status** |
| --- | --- | --- | --- | --- | --- | --- |
| R101 | LG[1],HW[2] | 6.3.2 | ConfiguredGrantConfig | 3 | Remove Editor's note: FFS on intraRepetition for frequency hopping for PUSCH repetition type B based on RAN1 agreement that intra-PUSCH-repetition frequency hopping is not supported. | Agreed. **Rapporteur:** Follow RAN1 updates. |
| R102 | LG[1]HW[2] | 6.3.2 | ConfiguredGrantConfig | 3 | Remove Editor's note: FFS on CG Type 1 for frequency hopping indication based on RAN1 agreement that CG Type 2 frequency hopping follows the indication in Activation DCI as DG frequency hopping (R1-2001402). | Agreed. **Rapporteur:** Follow RAN1 updates. |
| R103 | HW[2] | 6.3.2 | CSI-MeasConfig | 3 | Remove the RRC parameter CSI-AperiodicTriggerStateListForDCI-Format0-2 and semiPersistentOnPUSCH-TriggerStateListForDCI-Format0-2. | Agreed. **Rapporteur:** Follow RAN1 updates.[LG] We agree, but think that the field name (highlighted in yellow) should be also removed from *CSI-MeasConfig* field descriptions, as follow:aperiodicTriggerStateList, Contains trigger states for dynamically selecting one or more aperiodic and semi-persistent reporting configurations and/or triggering one or more aperiodic CSI-RS resource sets for channel and/or interference measurement. (see TS 38.214 [19], clause 5.2.1). |
| R104 | LG[1] | 6.3.2 | CSI-ReportConfig | 3 | Add *reportSlotOffsetListForDCI-Format0-2* and *reportSlotOffsetListForDCI-Format0-1* for aperiodic CSI report on PUSCH in *CSI-ReportConfig* because RAN1 decided to introduce these parameters for aperiodic CSI report on PUSCH as well as semi-persistent on PUSCH (R1-2001401). But, these parameters have been captured only for semi-persistent on PUSCH in the current RRC specification. aperiodic-v16xy SEQUENCE { reportSlotOffsetListForDCI-Format0-2-r16 SEQUENCE (SIZE (1.. maxNrofUL-Allocations-r16)) OF INTEGER(0..32) OPTIONAL, -- Need R reportSlotOffsetListForDCI-Format0-1-r16 SEQUENCE (SIZE (1.. maxNrofUL-Allocations-r16)) OF INTEGER(0..32) OPTIONAL -- Need R } OPTIONAL -- Need R | Agreed. **Rapporteur:** Follow RAN1 updates. According to the latest TS 38.214, these two parameters have been added for aperiodic CSI.  |
| R105 | LG[1]HW[2] | 6.3.2 | PUCH-TimeDomainResourceAllocationNew | 3 | Remove Editor’s notes on numberOfRepetitions, length and startSymbol in PUSCH-TimeDomainResourceAllocationListNew, and add two values ‘3, 8’ for the numberOfRepetitions (R1-2001401). | Agreed. **Rapporteur:** Follow RAN1 updates.  |
| R106 | HW[2][3] | 6.3.2 | PDSCH-Config | 3 | Add the parameter and corresponding field description of AntennaPorts-FieldPresence for DCI format 1\_2. antennaPortsFieldPresenceForDCI-Format1-2-r16 ENUMERATED (enabled) OPTIONAL, -- Need S | Agreed. **Rapporteur:** Follow RAN1 updates.  |
| R107 | HW[2][3] | 6.3.2 | PUSCH-Config | 3 | Add the parameter and corresponding field description of AntennaPorts-FieldPresence for DCI format 0\_2. antennaPortsFieldPresenceForDCI-Format0-2-r16 ENUMERATED (enabled) OPTIONAL, -- Need S | Agreed. **Rapporteur:** Follow RAN1 updates.  |
| R108 | HW[2] | 6.3.2 | SearchSpace | 3 | Update the maximum UL CI monitoring periodicity from 5 slots to 10 slots based on RAN1 agreement and such a clarification can be moved to the description of monitoringSlotPeriodicityAndOffset in consistent with other DCIs. | Agreed. **Rapporteur:** Follow RAN1 updates.  |
| R109 | HW[2] | 6.3.2 | UplinkCancellation | 3 | RAN1 Agreement:• The possible values for CI-PayloadSize, are {1,2,4,5,7,8,10,14,16,20,28,32,35,42,56,112}Add values of n5, n10, n20, n35 an n42 for CI-PayloadSize and Remove the relevant Editor’notes | Agreed. **Rapporteur:** Follow RAN1 updates.  |
| R110 | HW[2] | 6.3.2 | UplinkCancellation | 3 | Add value of n14 for timeDurationForCI and Remove the relevant Editor’notes | Agreed. **Rapporteur:** Follow RAN1 updates.  |
| R111 | HW[2][3] | 6.3.2 | UplinkCancellation | 3 | Add the parameter and corresponding field description of deltaOffset. deltaOffset-r16 INTEGER (0..2), | Agreed. **Rapporteur:** Follow RAN1 updates.  |
| R112 | HW[2][4] | 6.3.2 | CSI-ReportConfig | 3 | RAN1 agreed *when two PUCCH-Configs are configured, A PUCCH-ResourceId in a PUCCH-CSI-Resource refers to a PUCCH-Resource in the PUCCH-Config used for HARQ-ACK with low priority*. The clarification should be added to the field description for PUCCH-CSI-Resource. | Agreed.**Rapporteur:** It is used to clarify how to configure and map the PUCCH Resource ID for CSI to the PUCCH Config when two PUCCH Configs are configured[HW] agree[ER] agree [LG] we are fine with this in the light of the section 9.1 and 9.2.5.2 TS 38.213. |
| R113 | HW[2][4] | 6.3.2 | PUCCH-Config | 3 | RAN1 agreed *when two PU*CCH-Configs are configured*, A PUCCH-ResourceId in the multi-CSI-PUCCH-Resource list refers to a PUCCH-Resource in the PUCCH-Config used for HARQ-ACK with low priority*. The clarification should be added to the field description for multi-CSI-PUCCH-CSI-ResourceList. | Agreed.**Rapporteur:** It is used to clarify how to configure and map the PUCCH Resource ID for multi-CSI to the PUCCH Config when two PUCCH Configs are configured.[HW] agree[ER] agree [LG] we are fine with this in the light of the section 9.1 and 9.2.5.2 TS 38.213. |
| R114 | HW[2][4] | 6.3.2 | SchedulingRequestResourceConfig | 3 | RAN1 agreed *when two PUCCH-Configs are configured, SchedulingRequestResourceConfig can be configured in both PUCCH-Configs, If the same PUCCH resource ID can be configured in different PUCCH-Config, a PUCCH-ResourceId in a SchedulingRequestResourceConfig refers to a PUCCH-Resource in the PUCCH-Config containing the SchedulingRequestResourceConfig*The clarification should be added to the field description for Resource in SchedulingRequestResourceConfig. | Not Agreed.**Rapporteur:** It is used to clarify how to configure and map the PUCCH Resource ID for SR to the PUCCH Config when two PUCCH Configs are configured.[HW] agree[ER] We propose to change to “Pending”. This has relation to R117. If the understanding is that the same PUCCH resource ID cannot be configured in different PUCCH-Config, we don’t need to implement this change. [HW2] Agree with ER[LG] As mentioned by ER, this has been discussing in [AT109bis-e][058][URLLC] MAC remaining issues (Huawei). |
| R115 | HW[2][4] | 6.3.2 | BWP-UplinkDedicated | 3 | Remove the following Editor’note based on RAN1 agreements on CSI, multi-CSI and SR.Editor's note: From RAN1 Rapporteur Note: We don't have agreement on whether to do separate configuration for schedulingRequestResourceToAddModList and multi-CSI-PUCCH-ResourceList yet. However, we agreed to do separate configuration for all the remaining RRC parameter. From RRC parameter implementation perspective, it seems easier to introduce separate PUCCH-Confi for different HARQ-ACK codebooks. If there is no need to do separate configuration for schedulingRequestResourceToAddModList and multi-CSI-PUCCH-ResourceList, the corrsponding configuration can not include these two optional parameters and then in RAN1 spec can indicate that SR PUCCH resource and multi-CSI PUCCH resource can just follow the configuration in one of the PUCCH configurations.  | Agreed.**Rapporteur:** For the CSI and multi-CSI config part, it should be clear from above two clarification. For the SR part, RAN1 agreed that When two *PUCCH-Config*s are configured, *SchedulingRequestResourceConfig*can be configured in both *PUCCH-Config*s* If the same PUCCH resource ID can be configured in different PUCCH-Config, a *PUCCH-ResourceId* in a *SchedulingRequestResourceConfig* refers to a *PUCCH-Resource* in the*PUCCH-Config*containing the *SchedulingRequestResourceConfig*

[HW] agree, taking R112,113 and 114 into account, it is clear now and therefore the EN can be removed.[ER] Agree.[LG] Agree |
| R116 | HW[2][4] | 6.3.2 | BWP-UplinkDedicated | 3 | Remove the following Editor’noteEditor's note: It is not clear about how to use the pucch-ConfigurationList for PUCCH resources for SR and CSI in RAN2 understandings, for example, whether to use a PUCCH Config ID to indicate the corresponding pucch-Config in the pucch-ConfigurationList for a PUCCH resource. More RAN1 inputs are needed | Agreed.**Rapporteur:** It is pending to the outcome of the [056] email discussion. |
| R117 | HW[4] | 6.3.2 | BWP-UplinkDedicated | 3 | Add the clarification that different PUCCH Resource IDs are configured in different PUCCH-Config | Agreed.**Rapporteur:** It is pending to the outcome of the [056] email discussion. |
| R118 | HW[4] | 6.3.2 | PUSCH-Config | 3 | RAN1 Agreement:For PUSCH repetition Type B, intra-PUSCH-repetition frequency hopping is not supported.Remove the Editor’ noteEditor's note: FFS on intraRepetition for frequencyHoppingForDCI-Format0-1. | Agreed. |
| R119 | HW[4] | 6.3.2 | PUSCH-Config | 3 | RAN1 Agreements:For PUSCH repetition Type B, intra-PUSCH-repetition frequency hopping is not supported.Remove the Editor’ noteEditor's note: FFS on intraRepetition for frequencyHoppingForDCI-Format0-2 if pusch-RepTypeIndicatorForDCI-Format0-2 is set to 'pusch-RepTypeB'. | Agreed. |

*Note that the following change proposed from LG should be moved to IIOT WI* [To be confirmed by ER]*.*

1. Add pdsch-AggregationFactor in sps-Config because RAN1 decided to support PDSCH aggregation for DL SPS (R1-2001384). [1]

**Proposal 1: R101-R119 except for R114 are agreed.**

## 2.2 Corrections to eURLLC L1 configurations

In this subsection, as the rapporteur, we sort all the corrections to eURLLC L1 configurations based on contributions [1-4]. And companies are encouraged to provide comments directly in the column of “Proposed Status” for issues marked as ToDiscuss for easy reading and tracking. For instance, you can comment like this for each Issue.

| **Proposed Status** |
| --- |
| ToDiscuss. **Rapporteur:** [COMPANY]: Comments… |

| **Issue**  | **Company** | **Subclause** | **IE name** | **Class** | **Description/correction** | **Proposed Status** |
| --- | --- | --- | --- | --- | --- | --- |
| R201 | HW[2] | 6.3.2 | PUSCH-Config | 0 | Typos in the following terminologies should be corrected.*dmrs-UplinkForPUSCH-MappingTypeA- ForDCI-Format0-2*, *dmrs-UplinkForPUSCH-MappingTypeB- ForDCI-Format0-2*, *dmrs-UplinkForPUSCH-MappingTypeA-Format0-2* and *dmrs-UplinkForPUSCH-MappingTypeB-Format0-2* | Agreed. **Rapporteur:** Editorials. |
| R202 | HW[2] | 6.3.2 | PUSCH-TimeDomainResourceAllocationListNew | 0 | “-” is missing in DCI format 0-1/0-2 from the text below.The IE PUSCH-TimeDomainResourceAllocationListNew is used to configure a time domain relation between PDCCH and PUSCH for DCI format 0-1/0-2. | Agreed. **Rapporteur:** Editorials. |
| R203 | Ericsson (from RIL E126) | 6.3.2 | PUSCH-TimeDomainResourceAllocationListNew | 3 | Avoid “New” in PUSCH-TimeDomainResourceAllocationListNewBetter to just call the IE PUSCH-TimeDomainResourceAllocationList2 | Pending**Rapporteur:** It is also related to another Class 2 issues proposed. |
| R204 | HW[2] | 6.3.2 | SearchSpace | 1 | Remove formats0-1-And-1-1 in the value range of dci-FormatsExt to avoid redundancy with dci-Formats. | Agreed. **Rapporteur:** [HW] agree[Ericsson] agree[LG] Agree |
| R205 | HW[2] | 6.3.2 | SearchSpace | 1 | Remove the Editor’note of FFS formats0-0-And-1-0 since it is already included in dci-Formats. | Agreed. **Rapporteur:** RAN1 Agreement• Remove the bracket on formats0-0-And-1-0 in the column of value range for RRC parameter dci-Formats-Rel16.However, it is already included in dci-Formats.[HW] agree[Ericsson] agree[LG] Agree |
| R206 | Lenovo(from RIL B002) |  | RLC-Config | 2 | New values are introduced by t-StatusProhibitExt-r16 which are not overlapping with the legacy ones in t-StatusProhibit. In such case there is no need to introduce them by t-StatusProhibitExt-r16. Instead they can be introduced as Rel-16 NCE of t-StatusProhibit. Furthermore, there is no stringent need to have extension marker in DL-AM-RLC-v16xy.Replace “Ext-r16” by “-v16xy” and remove extension marker as shown below.DL-AM-RLC-v16xy ::= SEQUENCE { t-StatusProhibit-v16xy T-StatusProhibit-v16xy OPTIONAL -- Need N} | [HW] No strong view, but we think we can keep the text as it is to avoid critical extension.[ER] We agree that a critical extension should be avoided, and this RIL also points this out. Here the comment is more on the naming such as the use of “Ext” and “-r16” versus “-v16”. No strong view, but we prefer an aligned approach throughout the RRC spec on how to deal with these extensions. In that regard, we prefer Lenovo’s suggestion to change the IE name to T-StatusProhit-v16xy. Not sure about the field name though. Update: Moved to DiscMail#10 |
| R207 | I653 |  | RLC-Config | 2 | Looks like a configuration parameter that is stored. Hence should be Need M/R. Difficult to say which one without understanding how the IE is used but the extension marker and field description implies it should be possible to release this field independently and hence Need R might be more appropriate. | [ER] Agree on Need R [HW] AgreeUpdate: Moved to DiscMail#10 |
| R208 | I654 |  | RLC-Config | 2 | DL-AM-RLC-v16xy is not used and is an orphan | [ER] Agree and this should be used in RLC-Config [HW] Agree[LG] Agree. This needs to be added to am SEQUENCE? If so, Update: Moved to DiscMail#10 |

**Proposal 2: R201, R202, R204 and R205 are agreed.**

# 3 Conclusions

**Proposal 1: R101-R119 except for R114 are agreed.**

**Proposal 2: R201, R202, R204 and R205 are agreed.**

# 4 Reference

[1] R2-2003667 Draft 38.331 CR on L1 parameters LG Electronics draftCR Rel-16 38.331 16.0.0 B NR\_L1enh\_URLLC

[2] R2-2003612 Running RRC CR by capturing updated L1 parameters for NR eURLLC Huawei, HiSilicon draftCR Rel-16 38.331 16.0.0 F NR\_L1enh\_URLLC-Core

[3] R2-2003617 Introduction of the new L1 parameters for eURLLC [H042][H044][H050] Huawei, HiSilicon discussion Rel-16 NR\_L1enh\_URLLC-Core

[4] R2-2003615 Mapping between PUCCH resource ID and PUCCH Config for eURLLC Huawei, HiSilicon discussion Rel-16 NR\_L1enh\_URLLC-Core