**3GPP TSG-RAN WG2 Meeting #130 R2-250**

**Wuhan, P. R. China , 7th – 11st Apr, 2025**

**Agenda Item: 8.X**

**Source: Huawei, HiSilicon**

**Title: Summary of [POST129][510][XR] RRC running CR (Huawei)**

**Document for: Discussion and Decision**

# 1 Introduction

This paper summarizes the post meeting email discussion for the RRC running CR

**[POST129][510][XR] RRC running CR (Huawei)**

Scope: Update and review the CR

Intended outcome: Running CR for endorsement in the next meeting

Deadline: Long

Based on the companies' inputs, the proposals have been formulated at the conclusion section.

Please fill in the contact information in the table below

|  |  |  |
| --- | --- | --- |
| **Company** | **Contact Person** | **Email Address** |
| CATT | Hao Xu | xuhao@catt.cn |
| Futurewei | Yunsong Yang | yyang1@futurewei.com |
| Qualcomm | Linhai He | linhaihe@qti.qualcomm.com |
| OPPO | Zhe Fu | fuzhe@OPPO.com |
| Xiaomi | Yujian Zhang  Yanhua Li | zhangyujian@xiaomi.com  [liyanhua1@xiaomi.com](mailto:liyanhua1@xiaomi.com) |
| LGE | GyeongCheol LEE  Hanseul Hong | [gyeongcheol.lee@lge.com](mailto:gyeongcheol.lee@lge.com)  hanseul.hong@lge.com |
| Ericsson | Richard Tano | Richard.tano@ericsson.com |
| Sharp | Sangkyu Baek | baeks@sharplabs.com |
| Nokia | Chunli Wu | Chunli.wu@nokia-sbell.com |
| Vivo | Chenli | Chenli5g@vivo.com |
| Samsung | Weiping Sun | wp.son@samsung.com |

# 3 Examining the running CR

This section is used to collect comments for the running CR in *R2-250xxxx Running RRC CR for R19 XR\_v00\_Rapp*.

***Question0: Any comments on the running CR?***

|  |  |  |
| --- | --- | --- |
| **Company** | **Issue** | **Suggestion** |
| CATT | There is one typo in the Coversheet. | Change#8: Add remaining time threshold for autonomous retransmission.  [Rapp] Thanks, corrected. |
| CATT | For the field description of ***lcp-DefaultPriorityFallback***, the wording of first/second phase of the resource allocation among LCP procedure can be improved. | Prefer to use the wording “first/second round of the resouce allocation among LCP procedure”.  [Rapp] OK |
| CATT | For the field description of ***t-RxDiscard***, it stated in the last that “The value of the field should not be lower than that configured by the field *t-Reassembly*.” | In the current specification, beside the *t-Reassembly*, there is also another parameter “*t-ReassemblyExt*” , I just wonder whether we need to further clarify the relationship with parameter ***t-ReassemblyExt***.  [Rapp] we can change the field description to “The value of the field should not be lower than that configured by the field *t-Reassembly* or *t-ReassemblyExt”*  [FW] The values in *t-ReassemblyExt* are {ms210, ms220, ms340, ms350, ms550, ms1100, ms1650, ms2200}. We have a little bit doubt if any of these values are applicable to XR, given the short PDB/PSDB of XR. But we are also fine if we are trying to generalize the notion that ***t-RxDiscard*** should be lower than the corresponding reassembly timer for new use cases in the future. |
| FW(01) | In Change#2 IE text description:  Three issues:   1. Unclear what the threshold list is about (time or something else). 2. What are reported are not only remaining times but also data volumes. A simple and better fix is not getting into the details here. 3. Should specify that the values in the list are ordered in ascending order. | Change to the following:  ***dsr-ReportingThresList***  List of remaining time thresholds for reporting the enhanced DSR, as specified in TS 38.321 [3]. Values in number of milliseconds and ordered in ascending order.  Editor's NOTE: exact name of the DSR MAC CE introduced in R19 to be further discussed and aligned with the MAC spec.  [OPPO] We tend to agree with the issues mentioned by FW. The proposed change looks good to us.  [Rapp] I think we can change the description from “remaining time” to “delay status information” to accommodate the case for data volume reporting. It is not quite clear to us why the order matters, at least we have not agreed on this. Proposed an editor’s NOTE for further discussion.  Since there still seem to be some controversies in the name of the MAC CE, I also proposed we discuss it f2f in the next meeting. A proposed is formulated for this as well.  [FW] We are OK to change the original words of “remaining time” in the running CR to “delay status information”. However, we still prefer to change “List of DSR reporting thresholds” to “List of remaining time thresholds”. Because DSR reports both the remaining time and data volume, we’d better make it clear whether the list of thresholds is about the remaining time or about the data volume.  About the order, each threshold value in the list (except the first one) works with the value immediately before it to form a closed range (or a bin if you will, considering PDCP SDUs are sorted into the bins formed by the list of thresholds). The first bin begins from zero and ends at the first threshold in the list. The second bin begins from the first threshold and ends at the second threshold in the list, and so on and so forth. Therefore, the thresholds in the list being ordered in the ascending order seems to be a natural thing to do. Please refer to the definition of Delay-reporting PDCP SDU in the PDCP running CR to see how the list of thresholds is used. |
| FW(02) | In Change#8 and Change#9 IE text descriptions:  Editorial: incorrect indefinite articles being used before “RLC”. | Change “a RLC” to “an RLC” in both instances.  [Rapp] Since R is a consonant, we should use a??  [FW] Which indefinite article to use is determined by the first sound actually being made. Although R is a consonant letter, when we say “RLC”, we pronounce it as “ar el ci”, with the first sound made being a vowel sound. The same goes with “F” in “an F1 connection”, “H” in “an HARQ process”, “L” in “an LCID”, “M” in “an MME”, “N” in “an NG connection”, and “S” in “an S-TMSI”. This is also the reason why “an” is used in “an hour” due to the silent “h”. |
| QC (01) | Editorial comment on the field description of ***additionalPriority*** in Change #1 | ***additionalPriority***  The additional priority that overrides the logical channel priority configured by the field *priority* when the logical channel priority adjustment condition is satisfied as specified in TS 38.321 [3]. If the field is configured, the value of the field shall be lower than that of the field *priority*.  [Rapp] OK, corrected |
| QC (02) | Editorial comment on the field description of ***dsr-ReportingThresList*** in Change #2 | ***dsr-ReportingThresList***  List of DSR reporting thresholds for reporting delay status information in the Enhanced DSR, as specified in TS 38.321 [3]. Value for the IE *DSR-ReportingThreshold* in number of milliseconds.  Editor's NOTE: exact name of the DSR MAC CE introduced in R19 to be further discussed and aligned with the MAC spec. |
| OPPO(001) | In the current CR, both t-RxDiscard and stopReTxObsoleteSDU(i.e. Change#3.1 and #7) are mandatory. | These IEs could be optional since only the UE with such capability needs to support this functionality.  [Xiaomi] Agree with OPPO.  [Rapp] The field is configured as {enabled, disabled} already. If we simply add optional, an additional bit will be wasted.  Change the configuration as ENUMERERATED {enabled} OTPIONAL, and please see if it is OK |
| OPPO(002) | In the field description of stopReTxObsoleteSDU,  Based on our conclusion, Tx side stop transmission of the RLC SDU based on upper layer indication, whether it is because of discard timer expiry or not doesn’t need to be checked by the RLC entity. | Rewording to align with agreement and RLC Running CR “Indicates whether the Tx side should stop RLC retransmission of SDUs when discard indication of the SDUs are received from PDCP~~whose corresponding PDCP discard timer has already expired in the PDCP layer~~.”  [Rapp] No strong view but, OK |
| Xiaomi(01) | Editorial comment for Change#2: “dsr-ReportingThresList-r19 SEQUENCE (SIZE (1.. maxDSR-ReportingThres-r19)) OF DSR-ReportingThreshold”. | The space between “..” and “max” is not needed.  [Rapp] ok |
| Samsung(01) | For the naming of t-RxDiscard: From Rx perspective, it is about to determine an RLC SDU as outdated and abandoning it. The term “discard” may not be suitable for the case when no byte-segment is actually received for an RLC SDU. | Suggest to use “t-RxOutdated” instead of “t-RxDiscard”.  [Rapp] The discard is per gap/per entity not per RLC SDU/PDU/segment. SO i think the comment is not correct.  Keep the current field name. |

Based on the comments above, the rapporteur proposes the following proposal for discussion in the next R2 meeting.

***Proposal1: Discuss whether the entries of drs-ReportingThresholdList need to be configured in ascending order.***

***Proposal2: Determine the name of new R19 DSR from two options have been proposed currently: (a) multiple entry DSR; (b) enhanced DSR.***

4 Discussions

## 4.1 LCP enhancements

For LCP with additional priority, during RAN2#128, it was agreed that *As an optional capability, the UE can also support to fallback to default priority in the 2nd round of LCP*.

Then, with the introduction of the UE capability, another qustion to ask is whether the network can configure the UE to enable the fallback to the default priority in the 2nd round of LCP

Companies are invited to answer the following question

***Question1: Do companies think we should introduce RRC configuration to enable/disable the fallback to default priority in the 2nd stage of LCP?***

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| CATT | Yes | It is preferred that the LCP related configuration is under gNB’s control, for example, additional priority and remaining time threshold for LCP enhancement are configured by gNB, it is more nature for UE to perform the fallback capability also under gNB’s control. |
| Qualcomm | No | Such a configuration is not needed. If a UE is capable of fallback to default priority in the 2nd round, why should NW hold it back? Use of the additional priority is optional for UE, even when there is priority adjustable data. Why should gNB force UE to use additional priority, even when there is no priority-adjustable data?  If I remember correctly, this issue was discussed online when the UE capability was agreed. It was not agreed. |
| Futurewei | Yes | When the gNB performs UL scheduling with DSR information, knowing whether the UE will fall back or not in the second round may be a part of the consideration. |
| OPPO | Yes | Typically, UE’s behaviour is controlled by NW. Also, the controlling can align the understanding between UE and NW of how the 2nd round resource allocation does. |
| Xiaomi | No | Agree with Qualcomm. Whether to fallback to default priority in 2nd round can be left to UE implementation, without RRC configuration. |
| LG | Yes | Network should configure whether to apply additional priority in the second round of LCP based on UE capability. |
| Ericsson | Yes | Network should know what behaviour that the UE applies.  Comment to QC, we don’t think this statement is true at all “Use of additional priority is optional for UE”. There must be a predictable behaviour so network can estimate what priority the UE applies (which it can e.g. through the DSR). Based on the answers here there seems to be clear majority that network can take the priority into consideration when doing scheduling. |
| Sharp | Yes | We see that NW may want to turn on/off this behaviour, so RRC configuration is needed.  Without the RRC configuration, different UEs in the same cell have different LCP behaviours. It is impossible that the network configures the same UE behaviours for all UEs in the cell. |
| Nokia | Yes | As a general guidance from RAN2 ([R2-2002378](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_109_e/Docs/R2-2002378.zip)), we should avoid defining any functionality that has no RRC configuration but is dependent on capability bits. |
| Vivo |  | Technically, even we think a network configuration is needed. To be honest, this issue was discuss when we agreed to introduce a UE capability for the priority fallback, and no conclusion was made to introduce a new configuration from NW. |
| Samsung |  | We prefer to leave this issue open, and discuss further in next meeting, considering the three possible options:   1. If NW configuration is supported, UE follows NW configuration. (It is unclear what is the benefit/rationale/justification why NW should control it, considering it is about how the UL grant is used internally within a certain UE.) 2. If NW configuration is not supported, whether to fallback, when the fallback condition is satisfied, is up to UE implementation. (It is unclear why UE should report the capability then.) 3. If NW configuration is not supported, the capable UE should perform the fallback, if the fallback condition is satisfied. (It is unclear why the NW needs to know which UE performs fallback and which UE does not.) |

The majority of the companies (8) think that RRC configuration should be needed. Nokia also mentioned that there is a general guideline in R2 agreed before, as in [R2-2002378](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_109_e/Docs/R2-2002378.zip). 2 companies think we don’t need the UE capability; while one thinks this should be further discussed.

Based on the discussion above, we propose the following:

***Proposal3: Introduce RRC configuration to enable/disable the fallback to default priority in the 2nd stage of LCP***

## 4.2 DSR enhancements

For DSR enhancements, during RAN2#128, it was agreed in RAN2 that *The UE may also support including non-delay critical data ahead of delay critical data in the buffer size calculation for DSR, which is a capability indicated to the NW*.

Then, with the introduction of the UE capability, another qustion to ask is whether the network can configure the UE to inlcude the non-delay criticla data ahead of delay critical data in the buffer size calculation for DSR.

Companies are invited to answer the following question

***Question2: Do companies think we should introduce RRC configuration to enable/disable the inclusion of non-delay critical data ahead of delay critical data in the buffer size calculation for DSR?***

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| CATT | Yes | As one of the enhancements for DSR reporting, it is preferring to introduce RRC configuration to enable/disable this inclusion of non-delay critical data ahead of delay critical data in the buffer size calculation. |
| Qualcomm | Yes | This is different from LCP. Because even if a UE supports the inclusion of non-delay-critical data in DSR, it is up to NW scheduler whether it is needed. |
| Futurewei | Yes | The gNB decides what information is needed for it performing the UL scheduling. |
| OPPO | Yes | It can let the NW to decide which information it wants. |
| Xiaomi | Yes | If the NW enables UE to do this, when NW receives the DSR, it will know that the buffer size may include none delay critical data. This can help NW for scheduling. |
| LG | Yes | Network should configure whether to include non-delay critical data ahead of delay critical data based on UE capability. |
| Ericsson | Yes | It makes sense to have control of this behaviour from network side. |
| Sharp | Yes | Similar to the LCP issue, NW may want to turn on/off the feature. We think a common UE behaviour for all UEs in the cell is important. |
| Nokia | Yes | Same as Q1. |
| vivo | See comment | Our understanding is it could be up to UE implementation to do it or not. |
| Samsung | Yes | NW may want to unify the operation among the UEs for fairness, when there are UEs with and without such capability coexisting, since the reported buffer size is used in determining UL grant size. |

Similar with the discussion in question1, almost all the companies agree that the configuration is needed. Hence, we propose the following:

***Proposal4: Introduce RRC configuration to enable/disable the inclusion of non-delay critical data ahead of delay critical data in the buffer size calculation for DSR***

Currently, the maximum number of entries in the reporting threshold configuration is 4 as a placeholder, i.e., as many as 4 reporting thresholds can be configured by the RRC.



Companies are invited to provide their view on the maximum number of thresholds for the list of reporting thresholds. Rapp recommends that issues like MAC CE size, PSDB, report accuracy should be considered

***Question3: What should be the maximum number of configurable reporting thresholds in the enhanced DSR configuration?***

|  |  |  |
| --- | --- | --- |
| **Company** | **Maximum number of thresholds (e.g., 4, 8)** | **Comments** |
| CATT | 4 | The intention of introducing this multi reporting threshold is to supply more finer information about the delay for the related service, also we need to further balance with the overheads, from this point of view, we think 4 is enough. |
| Qualcomm | 4 or 8 | No strong view. Since the R19 DSR MAC CE does not use bitmap for reporting thresholds, the value of this maximum does not matter much. We trust NW would not configure too many reporting thresholds to cause excessive overhead. |
| Futurewei | 4 | Integrity handling of PDU Set requires that all PDUs belonging to a same PDU Set are handled together. Therefore, thresholds should be set to separate between PDU Sets, not within a PDU Set. After 4 PDU Sets, the oldest PDU Set will most likely be obsolete and discarded already. |
| OPPO | 4 | No strong view. While considering the reporting overhead, maybe 4 is enough as the max value for finer information provision. |
| Xiaomi | 4 | No strong view. 4 is enough. |
| LG | 4 | 4 should be sufficient. |
| Ericsson | 8 | 4 seem a bit limiting as a maximum possible value. It may be enough in many cases but there is no apparent reason to not allow more a maximum. It is anyway up to network to configure how many thresholds that will be used (which may in many cases be a lower number). The DSR is not only used for reporting PDU Sets and data may thus be more spread in time where finer granularity can be beneficial.. |
| Sharp | 4 or 8 | No strong view, but we prefer 2 to the power of n, i.e. 4 or 8. |
| Nokia | 4 | 4 could be enough as it is unlikely the NW scheduler would have so fine granularity for scheduling. |
| Vivo | 4 or 2 | No strong view. Even 2 is enough. |

For the discussion, most of the companies think 4 can be the maximum number of entries in the DRS reporting threshold configuration list. Hence, we propose the following:

***Proposal5: The maximum number of entries in the dsr-ReportingThresList is 4.***

## 4.3 Available data rate query

Regarding to the bit rate query, during RAN2#129, it was agreed as a working assumption that

**Working assumption:**

* **Support rate query MAC CE with the target to use same design that we will agree for rate indication MAC CE.**
* **The rate query MAC CE is configurable by the network, i.e. the network may turn it off completely (same as legacy).**

In legacy R15, for the support of recommended bit rate query, the following was supported in the MAC spec

|  |
| --- |
| If the MAC entity has UL resources allocated for new transmission the MAC entity shall:   1. for each Recommended bit rate query that the Recommended Bit Rate procedure determines has been triggered and not cancelled:   2> if *bitRateQueryProhibitTimer* for the logical channel and the direction of this Recommended bit rate query is configured, and it is not running; and  2> if the MAC entity has UL resources allocated for new transmission and the allocated UL resources can accommodate a Recommended bit rate MAC CE plus its subheader as a result of LCP as defined in clause 5.4.3.1:  3> instruct the Multiplexing and Assembly procedure to generate the Recommended bit rate MAC CE for the logical channel and the direction of this Recommended bit rate query;  3> start the *bitRateQueryProhibitTimer* for the logical channel and the direction of this Recommended bit rate query;  3> cancel this Recommended bit rate query. |

Then, in the RRC spec, the bit rate query prohibit timer was introduced in the logical channel configuration.



Following the agreement in this meeting (to follow the legacy configurability in the RRC by the network), rapp would like to ask the following question

***Quesiton4: Do companies think we should follow the legacy, i.e.,***

1. ***to introduce a prohibit timer for the UL transmission of the data rate query MAC CE?***
2. ***to enable/disable the rate query MAC CE by the presence of the prohibit timer in the RRC configuration?***

|  |  |  |  |
| --- | --- | --- | --- |
| **Company** | **(a)**  **Yes/No** | **(b)**  **Yes/No** | **Comments** |
| CATT | Yes | Yes | There is no distinguish motivation forseen from our point of view. |
| Qualcomm | Yes | Yes | We are fine with reusing the legacy behavior |
| Futurewei | Yes but also see comment | Yes | If the query also includes a data rate recommended by the UE, just having the prohibit timer may be insufficient, because if the timer is set to be too long, rate control mechanism may not be adaptive enough. On the other hand, if the timer is set to be too short, it will allow the UE to request a small delta rate adjustment, e.g. for every 1% rate improvement according to the new data rate table. A threshold on the delta data rate should be introduced to regulate the minimal delta rate adjustment that the UE can request so that the UE will not send a request, e.g., for every 1% possible rate improvement. |
| OPPO | Yes | Yes | Fine to follow the legacy way. |
| Xiaomi | Yes | Yes | OK to follow legacy behavior. |
| LG | Yes | Yes | OK to follow legacy behavior. |
| Sharp | Yes | Yes | It’s ok to align with legacy procedure. |
| Nokia | Yes | Yes | As legacy. |
| Vivo | Yes | Yes | As legacy. |

The majority of the companies think that we can follow legacy for the configuration of available data rate reporting. Hence, we propose the following:

***Proposal6: For the available data rate query MAC CE, confirm on the following:***

* ***Introduce a prohibit timer for the UL transmission of the data rate query MAC CE***
* ***Enable/disable the rate query MAC CE by the presence of the prohibit timer in the RRC configuration***

we have agreed that the available data rate indication shall be carried in the granularity of QoS flow level, with two possible options pending for further discussion

|  |
| --- |
| 3. Rate indication from gNB to the UE on a per QoS flow level is supported. FFS the details, e.g. if: 1) flows are indicated by MAC CE or 2) by RRC while MAC CE is per DRB. |

If the answer to the qustion4 is yes, the rapporteur would like to ask the following question

***Quesiton5: If the answer to the question above is yes, should the prohibit timer be configured in the QoS flow level?***

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| CATT | Yes, but | The granulirity of the forhibit timer should be align with the granulirity of the final adopt MAC CE. This issue can be postponed until the FFS on the details part is solved. |
| Qualcomm | - | We have the same comment as CATT |
| Futurewei | - | Agree to postpone it. |
| OPPO | Yes, but | Prefer to have the same granularity for prohibit timer configuration and the final adopted MAC CE indication. We are fine to postpone the discussion. |
| Xiaomi | - | Agree with CATT. |
| LG | - | Agree with CATT. |
| Sharp | No, but | We can see the same per-LCH prohibit timer can be used for all QFs of the LCH. Anyway, we agree with CATT that we can wait until the conclusion of the MAC CE format. |
| Nokia | - | Postpone. |
| vivo | Yes |  |
| Samsung | - | Agree with CATT. |

Most of the companies think that the discussion should be postponed, which is dependent on the granularity of the DL bit rate recommendation. Hence, we propose on the following:

***Proposal7: The granularity of the bit rate query prohibit timer (QoS flow level or DRB level) should be the same as that of bit rate recommendation. FFS based on further progress on bit rate recommendation.***

5 Conclusion

The email discussion is summarized by the following proposals:

Potentially easy to agree:

***Proposal3: Introduce RRC configuration to enable/disable the fallback to default priority in the 2nd stage of LCP***

***Proposal4: Introduce RRC configuration to enable/disable the inclusion of non-delay critical data ahead of delay critical data in the buffer size calculation for DSR***

***Proposal5: The maximum number of entries in the dsr-ReportingThresList is 4.***

***Proposal6: For the available data rate query MAC CE, confirm on the following:***

* ***Introduce a prohibit timer for the UL transmission of the data rate query MAC CE***
* ***Enable/disable the rate query MAC CE by the presence of the prohibit timer in the RRC configuration***

***Proposal7: The granularity of the bit rate query prohibit timer (QoS flow level or DRB level) should be the same as that of bit rate recommendation. FFS based on further progress on bit rate recommendation.***

Need further discussion:

***Proposal1: Discuss whether the entries of drs-ReportingThresholdList need to be configured in ascending order.***

***Proposal2: Determine the name of new R19 DSR from two options have been proposed currently: (a) multiple entry DSR; (b) enhanced DSR.***