3GPP TSG-RAN WG2 #130 R2-250xxxx

**St Julian’s, Malta, 19-23 May 2025**

**Agenda Item: 8.7.1**

**Source: Qualcomm Incorporated**

**Title: Summary of discussion on TPs for DSR in the MAC running CR**

**Document for: Discussion and Decision**

# 1 Introduction

During the discussion on [POST129][510][XR] MAC running CR, a few companies had a different preference on how Rel-19 DSR MAC CE should be captured. More specifically, instead of using “Single Entry DSR MAC CE” and “Multiple Entry DSR MAC CE” to represent Rel-18 and Rel-19 DSR MAC CEs respectively, they preferred to keep the “DSR MAC CE” used in Rel-18 spec unchanged and use “Enhanced DSR MAC CE” for the Rel-19 DSR MAC CE.

In the Appendix of this document, a TP based on “Enhanced DSR MAC CE” is provided. Companies are invited to review and compare it with the TP on DSR in R2-2501761 (the MAC running CR endorsed at RAN2#129bis).

# 2 Discussion

In the table below, please indicate which version of the TPs you prefer and reasons behind your choice.

**Question: which version of the TP do you prefer? If possible, please include reasons in your reply too.**

**Option 1. The TP in the Appendix based on “Enhanced DSR MAC CE”;**

**Option 2. The TP in R2-2501761 (the MAC running CR endorsed at RAN2#129bis), based on “Single Entry DSR MAC CE” and “Multiple Entry DSR MAC CE”;**

**Option 3. Neutral (i.e. You are fine with either option).**

|  |  |  |
| --- | --- | --- |
| **Company** | **Preferred option (1/2/3)** | **Comments** |
| LGE | 2 | It is weird to specify a specific MAC CE (i.e., R18 DSR MAC CE) using an article (i.e., **the** DSR MAC CE) while the general terminology to describe both R18 DSR MAC CE and R19 DSR MAC CE as “DSR MAC CE.”  For example, in following text of alternative TP, it is not clear to use “DSR MAC CE” and “the DSR MAC CE” with different meaning.   * Delay Status Report (DSR) MAC CE consists of either the DSR MAC CE or the Enhanced DSR MAC CE.   Given that “DSR procedure” specified in clause 5.4.9 is used to describe DSR procedure including R18 DSR and R19 DSR, reusing the DSR MAC CE for R18 DSR MAC CE causes confusion as well, since DSR procedure is used as a general terminology while DSR MAC CE is used only for R18 DSR procedure.  For Option 2, similar example can be found in other MAC CEs as well:  BSR procedure – Short BSR MAC CE, Long BSR MAC CE.  PHR procedure – Single Entry PHR MAC CE, Multiple Entry PHR MAC CE. |
| OPPO | See Comments | We have no strong view on Option 1 or Option 2, but we slightly prefer Option 2, since some text in Option 1 reads weird. For example, “Delay Status Report (DSR) MAC CE consists of either the DSR MAC CE or the Enhanced DSR MAC CE. ”.  BTW, we have two more comments.  1. There may be a typo in clause 6.1.3.72 of Option 1, i.e.  In either the DSR MAC CE or the Enhanced DSR MAC CE, as illustrated in Figure 6.1.3.72-1, the Remaining Time, the BT, and the Buffer Size fields for an LCG shall be reported in two consecutive octets. These three fields for different LCGs shall be included in the MAC CE in ascending order based on the LCGi.  [Rapporteur] This “a” is intentional, not a typo, because it refers to either “the DSR MAC CE” or “the Enhanced DSR MAC CE”.  We understand that “ or the Enhanced DSR MAC CE” needs to be removed since Figure 6.1.3.72-1 is for R18 DSR.  2. For the field description of Buffer Size in clause 6.1.3.72, we have similar comments as we mentioned in “R19 XR MAC running CR” for using R19 DSR MAC CE.  [Rapporteur] Please see my reply in the running CR. |
| Ofinno | 1 | Option 1 can prevent any impact on the Rel-18 DSR MAC CE. Using a Single Entry for the Rel-18 DSR MAC CE isn’t entirely appropriate because it can indicate the delay information of multiple LCGs. If there is a single entry for one LCG, multiple LCGs would require multiple entries.  [Rapporteur] The word “entry” refers to number of entries for an LCG. If this is the main concern, we can discuss possible alternative word for it, e.g. something like “single threshold.”  We’ve previously used ‘enhanced’ in several MAC CEs when introducing an additional function in a new release based on the legacy MAC CE from a prior release.  [Rapporteur] There are equal, if not more, number of opposite examples.  We suggest specifying Rel-18 DSR MAC CE and Rel-19 DSR MAC CE in separate sections. For instance, 6.1.3.72 is specified for Delay Status Report MAC CE (Rel-18) and 6.1.3.**X** for Enhanced DSR MAC CE (Rel-19). An example of this approach is the BFR MAC CEs: ‘BFR MAC CE’ is specified in section 6.1.3.23 and ‘Enhanced BFR MAC CE’ in 6.1.3.43.  [Rapporteur] This can be an option. However, it does not help the procedural clause at all.  Including ‘the’ before DSR MAC CE for the figure doesn’t help reduce confusion, and we’ve never used ‘the’ for any figure of MAC CE before. One way to avoid confusion is to reference the corresponding section, benefiting from specifying these two MAC CEs in different sections. For example, when referring to the Rel-18 DSR MAC CE, we can say ‘DSR MAC CE (as specified in 6.1.3.72).’ For the Rel-19 DSR MAC CE, we can say ‘Enhanced DSR MAC CE (as specified in 6.1.3.**X**).’” |
| ZTE | 2 | As captured in the running CR, Multiple Entry DSR MAC CE is used to indicate the DSR MAC CE introduced in R19 and Single Entry DSR MAC CE is used to indicate the DSR MAC CE introduced in R18, we think these terminology can clearly identify the different MAC CE. |
| Xiaomi | 1 | We slightly prefer option1.  LG’s example of Single Entry PHR MAC CE and Multiple Entry PHR MAC CE is different.  For Single Entry PHR MAC CE, UE only report an entry for Pcell and it is indeed a single entry. For Multiple Entry PHR MAC CE, UE report a Type 2 PH field for SpCell of the other MAC entity, a Type 1 PH field for the PCell. It further includes, in ascending order based on the *ServCellIndex*, one or multiple of Type X PH fields and octets for Serving Cells. It is indeed for multiple entries.  However, if we use “**Multiple Entry DSR MAC CE**”, it can be sometimes just one single portion which is actually not “**Multiple Entry**” but “**Single Entry**”.  To address LG’s concern that “Delay Status Report (DSR) MAC CE consists of either the DSR MAC CE or the Enhanced DSR MAC CE.”, maybe we can say “Delay Status Report (DSR) MAC CE consists of either the DSR MAC CE without reporting threshold or the Enhanced DSR MAC CE with reporting threshold.”. |
| vivo | 1 | We prefer option 1 as it has no impact on existing DSR.  There is no technical difference between these two options. Usually, we use “enhanced” to define further enhanced feature in MAC CE. Similarly there are many examples.  Besides, “multiple entry” could be also configured as “DSR with one entry”. So I think it is not so accuracy enough. |
| Futurewei | 1 but with the Enhanced DSR MAC CE specified in a new subclause. | We share the view with Ofinno that Rel-18 DSR MAC CE and Rel-19 DSR MAC CE should be specified in separate subclauses. We do not see that this separation will cause any major problem for the procedural text, although we have suggested a couple of changes to the related procedural text in the MAC running CR\_v10\_FW to make the description clearer.  Referring Rel-19 DSR MAC CE as the Enhanced DSR MAC CE seems to be consistent with the tradition when an enhanced version is introduced. Otherwise, besides the impact to the legacy DSR MAC CE, a problem of using “Single Entry” vs. “Multiple Entry” is that there is no guarantee that there will be multiple entries in the report for an LCG configured with multiple reporting thresholds. For example, there will be a single entry in the Rel-19 DSR MAC CE for an LCG when the data volumes associated with all other reporting thresholds configured for the LCG is zero except the first threshold, because of the following text in the running CR:    Even if we change them to “Single Threshold” vs. “Multiple Threshold”, it could still be misleading because there is a single triggering threshold for both MAC CEs. We will have to say “Single Reporting Threshold DSR MAC CE” vs. “Multiple Reporting Threshold DSR MAC CE”, too wordy. |
| Nokia | 2 | For 1, it is indeed a bit strange to say DSR = DSR or enhanced DSR.  For 2, about the issue companies raised on using the multiple entry DSR is not necessarily multiple entry when only one reporting threshold is configured or only one entry with data, we see no problem as the difference from the legacy single entry DSR is it has the E bit for each entry for the multiple entry one. |
| HONOR | 2 | Option 2 is clearer than Option1.  For the issue only one entry, we think it is OK, because multiple entry DSR can report single or multi entry and use EXT bit to indicate. |
| Ericsson | 1 but separate subclause | Tend to agree with Ofinno and FW that the solution with separate subclauses would make the specification clearer and it should remove the concerns around this single/multiple entry. Perhaps one such TP should first be provided before deciding so companies can give their views on this option. |
| Sharp | 2 | It would be better to have descriptive names for similar MAC CEs over multiple releases. |

# 3 Summary

The views from 11 companies are split between whether to use “Enhanced DSR MAC CE” (5) or “Multiple Entry DSR MAC CE” (6). Among the companies that prefer using “Enhanced DSR MAC CE”, three of them think it is better to capture the Enhanced DSR MAC in a separate clause, while the other two companies did not indicate whether they prefer the same or not.

The main arguments by the companies that prefer using “Multiple Entry DSR MAC CE” are that it is difficult to differentiate between “DSR MAC CE” (generic) or “the DSR MAC CE” (specific to Rel-18). Since these two terms are used in the procedural clause too, having separate clauses for two releases does not help.

Companies that prefer “Enhanced DSR MAC CE” argue that it is a tradition to do so (for further enhancement). Moreover, multiple entry is confusing too because it is possible to configure Rel-19 DSR MAC CE such as each LCG consists of only one entry.

Companies that prefer separate clauses argue that it is a tradition to so and it would help avoid the confusion between “DSR MAC CE” and “the DSR MAC CE”.

Given the divergence views, the rapporteur would suggest continuing the discussion online at the meeting.

# 4 Appendix

5.4.9 Delay status reporting

The Delay Status Reporting (DSR) procedure is used to provide the serving gNB with delay status of LCGs. RRC controls the DSR procedure by configuring the following parameters per LCG:

- *remainingTimeThreshold*: the threshold on remaining time for triggering a DSR for a logical channel within an LCG;

- *dsr-ReportingThreList*: the list of thresholds on remaining time for reporting the amount of UL data buffered in an LCG in a DSR. Delay status for an LCG is evaluated and reported based on remaining time, which is the remaining value of the running PDCP *discardTimer* of an PDCP SDU as specified in clause 7.3 in TS 38.323 [4]. The delay status for an LCG also includes the amount of delay-critical UL data or delay-reporting UL data for the LCG, depending on whether the LCG is configured with *dsr-ReportingThreList* (see clause 6.1.3.72). The reported amount of data is calculated according to the data volume calculation procedure specified in clause 5.5 in TS 38.322 [3] and clause 5.15 in TS 38.323 [4] for the associated RLC and PDCP entities, respectively.

If an LCG is configured for delay status reporting, the MAC entity shall for each logical channel within the LCG:

1> if the smallest remaining value of the running PDCP *discardTimer*s among all the PDCP SDUs buffered for the logical channel that have not been transmitted in any MAC PDU and have not been reported as data volume in a DSR MAC CE becomes below *remainingTimeThreshold* of the LCG; and

1> if there is no DSR pending for the logical channel:

2> trigger a DSR for the logical channel.

If there is at least one DSR pending, the MAC entity shall:

1> if UL-SCH resources are available for a new transmission:

2> if at least one LCG is configured with *dsr-ReportingThreList* and the UL-SCH resources can accommodate the Enhanced DSR MAC CE as specified in clause 6.1.3.72 plus its subheader as a result of logical channel prioritization:

3> instruct the Multiplexing and Assembly procedure to generate the Enhanced DSR MAC CE;

2> else if none of the LCG(s) is configured with *dsr-ReportingThreList* and the UL-SCH resources can accommodate the DSR MAC CE as specified in clause 6.1.3.72 plus its subheader as a result of logical channel prioritization:

3> instruct the Multiplexing and Assembly procedure to generate the DSR MAC CE as specified in clause 6.1.3.72;

2> else if there is no pending SR already triggered by the DSR procedure for the same logical channel as of this DSR:

3> trigger a Scheduling Request;

1> else if there is no pending SR already triggered by the DSR procedure for the same logical channel as of this DSR:

2> trigger a Scheduling Request.

NOTE 1: The availability of UL-SCH resources for the transmission of a DSR MAC CE or an Enhanced DSR MAC CE follows the same critieria specified in clause 5.4.5.

A PDCP SDU is considered to be associated with a DSR if it has not been transmitted in any MAC PDU and is a delay-critical PDCP SDU (as defined in TS 38.323 [4]) associated with the logical channel which triggered the DSR.

A MAC PDU shall contain at most one DSR MAC CE or one Enhanced DSR MAC CE. A MAC PDU shall not contain a DSR MAC CE or an Enhanced DSR MAC CE if it includes all PDCP SDUs associated with all the pending DSRs.

After a DSR is triggered, it is considered as pending until it is cancelled. The MAC entity shall cancel a pending DSR, when all the PDCP SDUs associated with the DSR have been discarded, or when a MAC PDU is transmitted and this MAC PDU includes a DSR MAC CE or an Enhanced DSR MAC CE that contains the delay information of all the PDCP SDUs associated with the DSR (as described in the clause 6.1.3.72), or when a MAC PDU is transmitted and this MAC PDU includes all the PDCP SDUs associated with the DSR.

NOTE 2: It is up to UE implementation whether the MAC entity includes a DSR MAC CE or an Enhanced DSR MAC CE in a MAC PDU if the MAC PDU can accommodate all PDCP SDUs associated with all the pending DSRs but is not sufficient to additionally accommodate the MAC CE plus its subheader.Editor’s note: In the above, I have used both “DSR MAC CE” and “Enhanced DSR MAC CE” instead of the generic term “DSR MAC CE”. The intention is to avoid potential confusion that whether “DSR MAC CE” is a generic term referring to both Rel-18 and Rel-19 DSR MAC CE or a specific term reserved for Rel-18 DSR MAC CE.

#### 6.1.3.72 Delay Status Report MAC CE

Delay Status Report (DSR) MAC CE consists of either the DSR MAC CE or the Enhanced DSR MAC CE. These two formats are identified by MAC subheader with an eLCID as specified in Table 6.2.1-2b.

The fields in the DSR MAC CE and Enhanced DSR MAC CE are defined as follows:

- LCGi: This field indicates the presence of delay information (i.e. the Remaining Time and Buffer Size fields) for the LCG i. The LCGi field set to 1 indicates that the delay information for the LCG i is reported. The LCGi field set to 0 indicates that the delay information for the LCG i is not reported;

- Remaining Time: In the DSR MAC CE, this field indicates the shortest remaining value of running PDCP *discardTimer* (described in clause 7.3 in TS 38.323 [4]) among all PDCP SDUs that are buffered for an LCG but have not been transmitted in any MAC PDU, at the time of the first symbol of the first PUSCH transmission that includes this DSR MAC CE. In the Enhanced DSR MAC CE, the field Remaining Time i,j indicates the shortest remaining time among the PDCP SDUs associated with the reporting threshold j of LCG i, as specified in clause 5.15 in TS 38.323 [4], at the time of the first symbol of the first PUSCH transmission that includes this Enhanced DSR MAC CE. The length of this field is 6 bits. This field is present only if the buffer size indicated by the corresponding Buffer Size field is not zero; otherwise, this field is reserved and set to 0. If present, the value *r* in this field indicates a remaining time within the range of (*r*, *r* + 1] msec;

- BT: This field is present only if the corresponding LCG is configured with *additionalBS-TableAllowed* and the buffer size indicated by the corresponding Buffer Size field is not zero;otherwise, this field is reserved and set to 0. If present, the BT field set to 1 indicates that the buffer sizes specified in Table 6.1.3.1-3 are used to set the value of the Buffer Size field, while the BT field set to 0 indicates that the buffer sizes specified in Table 6.1.3.1-2 are used instead;

- Buffer Size: In the DSR MAC CE, the Buffer Size field indicates the total amount of delay-critical UL data for an LCG according to the data volume calculation procedure specified in clause 5.5 in TS 38.322 [3] and clause 5.15 in TS 38.323 [4] for the associated RLC and PDCP entities, respectively, after the MAC PDU has been built. In the Enhanced DSR MAC CE, the field Buffer Size i,j indicates the total amount of delay-reporting data associated with the reporting threshold j of LCG i, according to the data volume calculation procedure specified in clause 5.15 in TS 38.323 [4] and clause 5.15 in TS 38.323 [4] for the associated RLC and PDCP entities, respectively, after the MAC PDU has been built. If the corresponding LCG is configured with *additionalBS-TableAllowed* and the amount of data to be reported by this field is within the buffer sizes specified in Table 6.1.3.1-3, the MAC entity shall use the buffer sizes specified in Table 6.1.3.1-3 to set the value of this field; otherwise, the MAC entity shall use Table 6.1.3.1-2 instead. This field is indicated in number of bytes. The length of this field is 8 bits.

- EXT i,j: This field is present only in the Enhanced DSR MAC CE. When set to 1, it indicates that an additional pair of Remaining Time field and Buffer Size field corresponding to the reporting threshold j+1 of LCG i is included immediately after the field Buffer Size i,j, as illustrated in Figure 6.1.3.72-2. When set to 0, it indicates that no additional field is present for LCG after the field Buffer Size i,j.

Either the DSR MAC CE or the Enhanced DSR MAC CE shall include delay status information of all LCGs which have pending DSRs when the MAC PDU containing it is to be built.

In either the DSR MAC CE or the Enhanced DSR MAC CE, as illustrated in Figure 6.1.3.72-1, the Remaining Time, the BT, and the Buffer Size fields for an LCG shall be reported in two consecutive octets. These three fields for different LCGs shall be included in the MAC CE in ascending order based on the LCGi.

In the Enhanced DSR MAC CE, as illustrated in Figure 6.1.3.72-2, the delay status information associated with a reporting threshold, which includes the BT, the EXT, the Remaining Time and the Buffer Size fields, shall be reported in two consecutive octets. If an LCG is configured with more than one reporting threshold, the delay status information associated with different reporting thresholds in the LCG should be reported consecutively in ascending order based on the values of the reporting thresholds. The delay status information associated with a reporting thresholdmay not be reported if the total amount of UL data associated with it is zero, according to the data volume calculation procedure specified in clause 5.5 in TS 38.322 [3] and clause 5.15 in TS 38.323 [4] for the associated RLC and PDCP entities, respectively. The delay status information for different LCGs should be included in the Enhanced DSR MAC CE in ascending order based on the field LCGi. Editor’s Note: Strictly speaking, it is not necessary to sort the delay status informtion for different reporting thresholds in an LCG. But by specifying an order, the content of the MAC CE would be more deterministic.

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Figure 6.1.3.72-1: The DSR MAC CE



Figure 6.1.3.72-2: The Enhanced DSR MAC CE------------------------------------------- [End of the 10th change] ----------------------------------------------