3GPP TSG-RAN WG2 Meeting #119 R2-220xxxx

Online, 17 – 26 August 2022

**Agenda item: 6.21.1**

**Source: Chair (MediaTek Inc)**

**Title: Comments on New proposals**

**WID/SID:** **TEI17**

**Document for: Discussion and Decision**

# 1 Introduction

This document is to collect comments on the following proposals:

* [AT119-e][038][NRTEI17] Comments on New proposals (Chair)

Scope: Collect a round of comments on the new TEI proposals in R2-2208241, R2-2207434, R2-2208430, R2-2208668, R2-2207938 in order to determine if any of these could be agreeable.

Intended outcome: Report for CB W2 Friday

Deadline: W2 Thursday 1800 UTC

# 2 Discussion

## 2.1 Inclusion of the CSI reports in MDT framework

[R2-2208241](file:///C:\Users\mtk65284\Documents\3GPP\tsg_ran\WG2_RL2\TSGR2_119-e\Docs\R2-2208241.zip) Inclusion of the CSI reports in MDT framework Nokia, Nokia Shanghai Bell, Deutsche Telekom, Verizon discussion Rel-17 TEI17, NR\_ENDC\_SON\_MDT\_enh-Core R2-2206144

Proposal 1: UE CSI reporting is added to the MDT framework to allow for advanced network optimization procedures as part of TEI17.

Proposal 2: RAN2 is asked to agree to TS37.320 changes as provided in the Annex.

|  |  |  |
| --- | --- | --- |
| Company | Support / CanAccept / Oppose / Question | Comments and justification for the expressed opinion (and/or question). |
| Chair |  | Chair initial comments (open ended): no impact to the UE, impact to the base-station. CSI can map reasonably to achievable L1 bitrate so it may be useful. Could be a low hanging fruit, but may have impact in other groups, so not clear if TEI is the best WI? |
| Nokia | Support | Proponent |
| LG | CanAccept | As the CSI reporting is already there, it can be used for MDT without any UE impact. No strong view. |
| Huawei, HiSilicon | Question | Regarding this contribution, we have some questions:  **Q1: About use cases**  The paper mentions the following. We understand that only management-based MDT is considered because it may have no RAN3 impacts. However, what about signalling-based MDT? No need to consider it, or do it in Rel-18? In addition, should SA5 check the signalling-based MDT for such enhancements?  *CRs to SA5 with limited impact in accordance with other reported MDT parameters will be submitted after the agreement . If only management-based configuration is allowed, there is no impact on RAN3 specification. OAM sends Trace Session Activation messages directly to gNB-DU.*  **Q2: What are the the reporting metrics**  It mentions the following. In current spec, there are couple of metrics for CSI reports, so we wonder whether the gNB need to collect all standard-defined metrics for CSI report, or part of metrics? If part of, what are the detailed metrics.  *Existing UE CSI measurements as send from the UE via Uplink Control Information include Precoding Matrix Indicator (PMI), Rank Indicator (RI) and Layer Indicator (LI) associated to the specific CSI measurement resource indicated by the CSI-RS Resource Indicator (CRI).*  **Q3: What are the reporting criteria and results**  What are the reporting period if gNB is to report the collected metrics to OAM? What are the results the gNB should send to OAM? E.g. the original results or processed results. This Q3 seems to be related to SA5, but we think they are impacting the gNB implemention, e.g. processing requirement, memory.  In general, on one hand, if only looking at the RAN2 impacts mentioned in the paper, it is not much; on the other hand, our Q1/Q2/Q3 are about the impacts to network side, and we expect some responses in order to better check the enhancment. In addition, we are not sure whether the enhancment should be discussed at SA5 first, because the above questions are more like SA5 scope. |
| Nokia |  | **Answer to the Questions by Huawei:**  **Ad. Q1:**  The use case is aiming at cell configuration improvement for NR MIMO/beams. Hence, signaling based MDT (towards one particular UE) does not help here. Our intention is to define support for statistical data at cell level. That’s why only management-based MDT is the target. Targeting signaling based MDT would impact RAN3 specifications (to support the activation through AMF), while the results from the single/particular user may not be necessary or justify the complexity. This is also the reason to not propose the enhancement as a RAN WI objective.  **Ad. Q2:**  CSI Report (as per 38.214) that happens to be available from the UE by chance, for other purposes, i.e., based on availability. Without extra burden or new requirements to the gNB.  **Ad. Q3:**  We propose to handle the CSI reports in the same way as Power Headroom reporting, that is available L2 metric. It’s handling is defined in SA5 in a very simplistic way, without imposing extra requirements for MDT purposes: it does not require processing the received results, but makes a placeholder in Trace Records to facilitate sending the available M2 to TCE:  Example with TS32.423 covering Power Headroom related Trace Record:   | M2 | PH distr | Distribution of the power headroom samples reported by the UE during the collection period. | TS 38.213 [37]  TS 32.422 [3]  TS 37.320 [32] | | --- | --- | --- | --- |   I.e.: no impacts to RRC signalling. |
| Vodafone |  | If there is no UE impact, we think it can be introduced, but I am not sure what is possible impact to other specifications, because of MDT report? |
| Ericsson | Question | In our understanding collecting CSI report from DU to TCE is not fully in RAN2 scope, at least as first place.  Isn’t it necessary that this topic be discussed in SA5, first? |
| vivo |  | Fine with the intention. However, agree with the chair that no impact to the UE, and the change request seems not in RAN2 scope.  Can be contribution driven and discussed in other WGs, e.g., RAN3 or SA5. |
|  |  |  |
|  |  |  |

## 2.2 SDAP end-marker in RLC UM

[R2-2207434](file:///C:\Users\mtk65284\Documents\3GPP\tsg_ran\WG2_RL2\TSGR2_119-e\Docs\R2-2207434.zip) SDAP end-marker in RLC UM Apple, Futurewei, Spreadtrum, FGI, Asia Pacific Telecom, T-Mobile USA, ZTE Corporation discussion Rel-17 TEI17 R2-2205679

*Proposal 1: RAN2 to study how the handling of PDUs carrying SDAP end-marker or RDI can be enhanced to mitigate against potential message loss in RLC UM in Rel-17.*

|  |  |  |
| --- | --- | --- |
| Company | Support / CanAccept / Oppose / Question | Comments and justification for the expressed opinion (and/or question). |
| Chair |  | Chair initial comments (open ended): This was discussed in Rel-15 and was left as is, assuming an impl timer will resolve the situation, and indeed the timer brings some delay. Proposal to study is not optimal for TEI type work, but can check the level of interest. |
| Apple | Support (Proponent) | Moving on from Rel-15 the NR feature set has been enhanced to support new services, many of which facilitate a lower end-to-end latency. As a consequence, later releases are expected to use RLC UM more widely. For example, RLC UM on a dedicated DRB is a likely deployment in use-cases such as IIoT, URLLC, advanced interactive services and gaming in Rel-17.  When a DRB is configured with RLC UM, the end-marker in UL or the RDI in DL can get lost and introduce unwanted side-effects.  **•** In the UL, a lost end-marker may cause the gNB to buffer data for a long time, hampering user experience and adding delay.  **•** In the DL, a lost RDI packet from the gNB would cause the UE not updating the QoS flow to DRB mapping. Thus, the UE would continue sending UL packets of the QFI on the old DRB while the gNB buffers packets waiting for the end-marker.  Therefore, we would like to see if companies are open to revisit some of the SDAP procedures with the aim to reduce unintended delays in scenarios where the RDI or end-marker can get lost. Our intention is to check how to potentially address these issues. We are open to a range of solution options. By “study” we mean that suitable approaches could be sorted in an email discussion, but no extensive study phase.  Depending on which option is chosen we do not think a timer is necessarily needed. Some of the options can be lightweight without too much impact on specs and implementation. A quick comparison of the solution options:  **• Option 2** may be straightforward by having the UE to (provisionally) repeat the end-marker, which is not allowed in current specifications.  **• Option 1** could latch upon the survival time feature. Alternatively, RAN2 could simply increase the reliability of the initial transmission.  **• Option 3** perhaps is a clean approach, but it may need a new DL control PDU or some form of an ACK, so the spec impact could be slightly higher.  **• Option 4** is also relatively straightforward at least from a UE perspective, and to identify when to repeat the RDI it could be up to network implementation. |
| Nokia | Can Accept | We are fine with having the end marker on the old bearer for both RLC AM and RLC UM, but we would question the need to improve its reliability for RLC UM.  In general, we believe it would be more important to give the old bearers (or the packets of that QoS flow in the old bearer) the same priority as the new bearer so that the delay impacts of the packets from the relocated QoS flow remaining in the old bearer are minimised. |
| LG | Oppose | This issue was discussed in Rel-15, and it was concluded that no enhancement is needed for loss of SDAP end marker. Even if the SDAP end marker is lost, the network implementation can handle the buffered data, e.g. using reordering timer in the network side. |
| Samsung | Oppose | We believe gNBs can predict the loss of an end-marker, and if it becomes an issue, gNB could simply not trigger QF-DRB remapping. |
| Huawei, HiSilicon | Not suitable for TEI | We feel it is not proper to discuss this issue in TEI if looking at the proposed solutions. As Rel-18 already starts, we think it would be better to move this discussion with all relevant issues under one WI, e.g. XR. |
| Vodafone | Question | In general, we tend to agree that it might be better to look deeper into this issue. However we would like to ask the Proponent, which part of the specification forbid to resend the end-marked packet? |
| vivo | Oppose | Agree with Chair. We are sceptical how critical is the issue. And we think implementation can perfectly handle this. Unless it is proven that implementation is not sufficient, we do not think we should re-open this discussion. |
|  |  |  |
|  |  |  |

## 2.3 Remote access issue

[R2-2208430](file:///C:\Users\mtk65284\Documents\3GPP\tsg_ran\WG2_RL2\TSGR2_119-e\Docs\R2-2208430.zip) Discussion on remote access issue CMCC, vivo, Huawei discussion Rel-18 TEI

*Proposal 1: RAN2 is kindly asked to confirm the remote access issue, that UE may access to a remote cell due to the radio signal transmitted and reflected by atmospheric and seawater with tiny propagation loss at some certain temperature and humidness conditions.*

*Proposal 2: RAN2 is kindly asked to confirm that the current implementation solutions cannot completely address the remote access issue.*

*Proposal 3: RAN2 is kindly asked to discuss the potential solutions, e.g.:*

*– Introduce a TA threshold in the system information to indicate the maximum Timing Advance to access the cell.*

*– If the received TA is larger than TA threshold, UE should apply Qoffsettemp for R criteria when UE goes back to idle/inactive mode. No change to the existing RA procedure.*

|  |  |  |
| --- | --- | --- |
| Company | Support / CanAccept / Oppose / Question | Comments and justification for the expressed opinion (and/or question). |
| Chair |  | Chair initial comments (open ended): In my experience, this kind of “strangeness” in the network is quite normal, i.e. for deployments that has significant shadowing effects or open water etc, the best coverage for a UE may indeed be by a distant cell rather than the closest base-station, but RAN2 usually assumes that from radio perspective (interference etc) it is good to keep the UE on the best cell, distant or not. For very distant cells, it has been recognized in the past that there are issues with the resulting camping or connection being very unstable. For this purpose it is possible today to exclude or deprioritize cells from UE evaluation, by neighbor cell lists. |
| Nokia | Question | A solution affecting UE implementation is only a partial fix.  Furthermore how can we ensure that TA is long in this case as the error scenario is straightline ? In general we are not convinced that chiba lake issues (which this is) cannot be solved by qoffesttemp.  The most straightforward solution would be to fix the tracking app in order log the location of the UE. |
| LG | Oppose | Agree with chair’s comment. In addition, we think this kind of region-specific issue is not a normal case, and it should be solved by implementation not by standard. |
| Samsung | Oppose | We believe RAN2 already have a solution (i.e., *connEstFailCount*, *connEstFailOffset*, *connEstFailOffsetValidity* in 38.331) for this issue. |
| Huawei, HiSilicon | Support | This issue does exist, we are open to discuss how to solve it. |
| CMCC | Support as proponent | Thank you for Chair and companies’ comments. Here is my response.   1. Regarding to the questions from Nokia and Samsung, comparing with ‘Chiba’ in which the UE can only camp on but failed to access the concerning cell due to bad UL channel, one big difference for our identified remote access issue is that the UE can both camp on and successfully perform random access into the concerning cell. That is because in our TDD system, DL and UL are on the same frequency and sharing the same channel condition. So the remote access UE successfully access the remote cell and doesn’t suffer from RLF. This makes the current Qoffsettemp and connEstFailOffset less effective in our issue. 2. Regarding to Chair’s comments on deprioritize the remote cells from neighbouring cell list, in current spec, at most 16 PCIs can be configured in SIB3, and it is unrealistic for operator to configure a complete list for all the remote cells in the SIB3 neighbouring cell list, since the remote cells would change as the temperature and humidness conditions changing on the strait.   So, I am afraid the implementation solutions still cannot completely address the issue. |
| Vodafone | Question | We are not sure which radio related problem is going to be solved here. If the problem is with the corona tracking app, we guess it should be addressed/solved by upper layers. On the other hand, we think we might expect similar “remote” UEs also in case of drones, so we would be happy to understand the use case more as we also agree, we already solved “similar” issue with CHIBA, but there they was a radio related problem |
| Ericsson | Question | We tend to agree with the chair comments, we are talking about a fundamental (physical) property of wireless networks and indeed the UE should use the best cell whenever possible.  Thus, the use case as presented in the contribution seems to go against the physics to some extent (i.e. with some specific conditions as proponents explain), and like Nokia we think such issues should be fixed on a different level (e.g. in the application), has this been considered?  We agree such situation can happen, but we don’t think there needs to be standardized solution. |
| vivo | Support | Proponent, we agree with CMCC that CHIBA solution can not solve this issue. Also Putting offset in RRC release message is also OK. |
|  |  |  |

## 2.4 DRX correction for DCI controlled bundling

[R2-2208668](file:///C:\Users\mtk65284\Documents\3GPP\tsg_ran\WG2_RL2\TSGR2_119-e\Docs\R2-2208668.zip) Correction to DRX operation with bundling controlled in the DCI Ericsson, Nokia, T-Mobile USA, Verizon, Docomo discussion Rel-17

*Proposal 1 Introduce a configurable parameter drx-LastTransmissionUL that enables the start of the drx-HARQ-RTT-TimerUL after the end of the last transmission (within a bundle) instead of after the end of the first transmission (within a bundle).*

*Proposal 2 Introduce a new UE capability and corresponding RRC signalling for drx-LastTransmissionUL.*

|  |  |  |
| --- | --- | --- |
| Company | Support / CanAccept / Oppose / Question | Comments and justification for the expressed opinion (and/or question). |
| Chair |  | Chair initial comments (open ended): This was briefly discussed before, with a mix or positive and negative comments. Anyway the proposal is limited, clear and could be implemented asap (as required for TEI) - in case there is more support / less objections now. |
| Apple | CanAccept | We agree that the proposed handling may reduce UE active time in cases where the HARQ RTT timer is (much) shorter than the time required to transmit all (many) TB repetitions. However, there are also other aspects to consider:  1. The updated handling is targeting a subset of services/scenarios only, but a UE may have multiple active services of different characteristics at the same time.  2. The network can configure the HARQ RTT timer to a value that is longer than the max TB repetition time, e.g., in a typical setup. In this case, the updated handling proposed may lead to a slight increase in UE power consumption since it removes opportunities for micro-sleep in between TB repetitions.  3. From a UE perspective, we would like to be able to terminate TB repetitions early, for example, there is no point continuing TB repetitions if already the first transmission was successful. Moreover, if the TB was not received correctly then the NACK would typically come after the last TB.  Since there is a capability and Rel-17 is a new release we can accept if majority of companies supports, otherwise, we’d tend to rely on the legacy handling. |
| Nokia | Proponent |  |
| LG | Oppose | The network sets the repetition number based on estimation of transmission success probability. However, it is just a probability. It does not mean that only the last transmission can be succeeded.  For example, even if the network sets Repetition=8 to ensure 99% of success probability, the UE can succeed in the first or second transmission. If the HARQ RTT Timer starts after the first transmission according to legacy, the network can send Cancellation to the UE to skip the UL transmission from the 5th repetition. However, in the proposal, the HARQ RTT Timer always starts after the last transmission, which means that the UE uselessly performs 5th to 8th transmission.  We think skipping UL transmission is much helpful for UE power saving than skipping PDCCH monitoring, because TX requires more power than RX. Skipping only one UL TX may be better than skipping PDCCH monitoring for multiple subframes.  In addition, we are not sure how the network can always perfectly control the repetition number. The repetition number depends on radio condition that can be getting worse or better due to some reasons (e.g., UE moving fast, unpredictable interference, etc), which is unpredictable by the network. |
| Samsung | Oppose | As indicated in the previous meeting, we think the proposal is an optimization for infrequent case, so it may not be essential. That is, this enhancement might be useful only if UE supports the eURLLC feature (*pusch-RepetitionTypeB-r16*), and network configures the feature for e.g. voice service (as illustrated in the contribution), and network configures DRX with short *drx-onDurationTimer* and *drx-InactivityTimer*. |
| Huawei, HiSilicon | Question | We understand the intention. It is noted that this issue was discussed in R16 UP before but agreed and it seems the main concern is that it would disable early termination, e.g. CG-DFI, which can be used to reduce power for unnecessary repetitions, so it is unclear if this proposal would benefit in power consumption for a large number of repetitions. |
| vivo | Can Accept and Question | We are fine with the proposed solution with optional capability signaling, considering that the maximum number of UL transmission repletion has been extended to 32. There have some valid use cases for Rel-17 UEs with UL enhancement (i.e. we don’t see this kind of optimization is needed for the legacy R15/R16 UEs as a large value of HARQ RTT timer can generally use to defer the starting point of HARQ ReTx timer).  In this sense, we are wondering whether the capability *maxNumberPUSCH-TypeA-Repetition-r17* should be treated as a prerequisite feature for supporting the proposed new feature? |
|  |  |  |
|  |  |  |
|  |  |  |

## 2.5 Priority based inter-freq measurement reporting

[R2-2207938](file:///C:\Users\mtk65284\Documents\3GPP\tsg_ran\WG2_RL2\TSGR2_119-e\Docs\R2-2207938.zip) Priority based inter-freq measurement reporting Apple discussion Rel-17 TEI17

*Moved from 6.21.2*

*Proposal: Consider a reporting priority based mechanism to address the problem.*

|  |  |  |
| --- | --- | --- |
| Company | Support / CanAccept / Oppose / Question | Comments and justification for the expressed opinion (and/or question). |
| Chair |  | Chair initial assessment (open ended): I understand that there is some interest for this, but as RAN4 is the group for detailed measurement behavior, it is somewhat difficult to see that this should be a RAN2-only topic (in order to arrive at a function that makes sense). Same comment applies for the referenced R2-2202436. |
| Ericsson | CanAccept if… | We are generally fine with enhancing the inter-frequency measurement configuration and reporting and we would like also to clarify that in our contribution in [R2-2205832](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_118-e/Docs/R2-2205832.zip) submitted in the last RAN2 meeting we propose solutions that are confined only to RAN2 and do not require any RAN4 work.  According to this, we are ok to discuss this but also the solutions proposed in [R2-2205832](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_118-e/Docs/R2-2205832.zip) should be part of the discussion. |
| Nokia | Question | Seems like a RAN4 topic. |
| BT | CanAccept including [R2-2205832](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_118-e/Docs/R2-2205832.zip) proposals | Currently, UEs perform HO measurements in a vendor specific way. That difficult the network engineering and its maintenance, e.g. load balancing when HO can cause an undesirable extra.  As Ericsson mention, our contribution [R2-2205832](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_118-e/Docs/R2-2205832.zip) in last RAN2 proposes several RAN2 self-contained solutions. For this problem and being realistic, we need to avoid any impact on RAN4.  We understand this topic is sensible for UE vendors and chipset manufacturers. For that reason, our idea is to discuss a signalling based solution that suit everyone.  We are fine to discuss Apple proposal but in addition, we consider [R2-2205832](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_118-e/Docs/R2-2205832.zip) proposals needs to be added to the discussion. |
| Samsung | Oppose | In general, we think that the issue can be addressed by NW implementation i.e. NW can configure appropriate frequencies to be measured by UE accordingly.  If NW wants to configure more frequencies than UE supports currently, we think RAN4 should discuss first about UE requirements, similar as what we have done in LTE. Thus, we are not sure whether this enhancement lies in RAN2-only topic. |
| LGE | Oppose/Question | The solution in R2-2207938 artificially delays MR triggering for less-prioritized frequency. We do not think this is a good idea. We do not simply know what happens in near future. The best consequence would be that MR will be triggered on the prioritized frequency during the delayed period and HO to the prioritized frequency is executed. Note even in this best case, the risk of HO failure or RLF may increase due to the serving cell quality getting lower due to the late-triggering of HO. The worst consequence would be that no MR will be triggered on the prioritized frequency during the delayed period and delayed MR for the non-prioritized frequency is reported only then. The worst consequence would delay HO, which certainly increases the risk of HO failure. The similar behavior now from network side was also considered as network implementation option#1 in R2-220426, which we think is not desirable for the same reason.  We note that R2-220436 (RAN2#117) already explains the possible network implementation options with their limitations and proposes new standard solution options. But, we wonder why other smart network implementations cannot resolve the issue. For instance, if the network wants to prioritize a certain frequency over other frequencies as a mobility target, it can set somewhat relaxed MR triggering conditions for the reporting condition associated with the prioritized frequency, so that an initial MR for the prioritized frequency can be triggered more likely earlier than other MRs associated with non-prioritized frequencies. Network may even configure periodic reporting, if really needed, for the prioritized frequency. This will incur more frequent reporting, but it should not be considered as a serious problem if the prioritization of the frequency is really important and urgent.  Other solutions in R2-2205832 are unnecessarily complicated.  In conclusion, we do not see a strong need to adopt new complicated solutions for a problem that can be solved by smart network implementation. |
| Huawei, HiSilicon | Oppose | Not realistic to have such optimization without RAN4 involvement. |
| Apple | Proponent | The proposal in this contribution is to address a real field problem. We can understand the concern from Chair that this may impact RAN4 requirement. Probably first we can discuss if the problem can be acknowledged in RAN2. |
| Vodafone | Support finding a solution | We agree the problem exist and we also agree that we should solve it by standard and not leave to NW implementations, so we are supporting BT. As a way forward, I think it makes sense to discuss all proposed solution (also discussed in R2-2207938) and find a most suitable/agreeable from all sides. |
|  |  |  |

# 3 Conclusion

TBD