**3GPP TSG-RAN** **WG2 Meeting #111-e R2-200xxxx**

**Electronic, 17th – 28th August 2020**

**Agenda Item: 5.4.1.5**

**Source: Huawei, HiSilicon**

**Title: Summary of offline 008 – NR UAI**

**Document for: Discussion and decision**

# Introduction

This document summarizes the following offline discussion.

UE assistance information

* [AT111-e][008][NR15] NR UAI (Huawei)

Scope: Treat [R2-2007792](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_111-e\Docs\R2-2007792.zip), [R2-2007793](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_111-e\Docs\R2-2007793.zip), [R2-2007794](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_111-e\Docs\R2-2007794.zip), [R2-2007795](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_111-e\Docs\R2-2007795.zip), [R2-2006986](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_111-e\Docs\R2-2006986.zip), [R2-2006987](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_111-e\Docs\R2-2006987.zip), [R2-2006997](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_111-e\Docs\R2-2006997.zip), [R2-2006998](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_111-e\Docs\R2-2006998.zip) (proponents to drive)

Part 1: Decision whether to make corrections, identify agreeable parts. Identify Controversial issues for on-line treatment (if any).

Deadline: Aug 20, 0900 UTC.

Part 2: For agreeable parts, continuation to agree CRs.

Deadline: Aug 26, 0900 UTC.

To be noted, the paper R2-2006997 and R2-2006998 are also included in offline discussion [AT111-e][042][NR15], and I understand these two papers are more suitable to be discussed in offline-042. Thus, these two papers are not included in this email discussion.

# Discussion

## Condition of stopping overheating prohibit timer (R2-2007792/R2-2007793)

The CR [1][2] proposes to that on condition of receiving *overheatingAssistanceConfig* set to release, the overheating prohibit timer T345 should be stopped.

In current specification, the overheating prohibit timer T345 is stopped upon initiating the connection re-establishment and resume procedures. However, if the *overheatingAssistanceConfig* is set to release, the overheating prohibit timer is not valid anymore, thus it should be stopped in the UE side.

|  |  |  |  |
| --- | --- | --- | --- |
| T345 | Upon transmitting *UEAssistanceInformation* message with *overheatingAssistance* | Upon initiating the connection re-establishment procedure, upon initiating the connection resumption procedure, and upon receiving *overheatingAssistanceConfig* set to *release.* | No action. |

**Q1. Do companies agree the intention and proposed changes of this CR?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree / Disagree** | **Comments** |
| MediaTek | Agree | Looks like a straightforward correction. Could be in Rapporteur’s CR. |
| Qcom | Agree |  |
| CATT | Agree |  |
| Vivo | Agree |  |
| Samsung | Agree | Same view as MediaTek i.e. minor so appropriate to capture in rapporteurs CR |
| Nokia (malgorzata.tomala@nokia.com) | Agree |  |
| Intel (Sudeep.k.palat@intel.com) | Agree but | The normative behavior is already captured in the procedural text. The Annex is only informative. So we agree with MediaTek that it can be included in rapporteur’s CR. |
| Ericsson |  | This table is for information only, so we do not see a strong need to clarify it. If companies see a need to clarify, it can be merged to rapporteur CR. |
| OPPO  wangshukun@oppo.com | Agree |  |

**Summary**: All companies agree with the intention of this CR, four companies mention that it can be included in rapporteur’s CR.

**Proposal 1: The contents of CRs in R2-2007792/R2-2007793 are agreed, and are merged into 38.331 Rapporteur CR.**

## UE assistance information transmission upon reconfiguration with sync (R2-2007794/R2-2007795, R2-2006986/R2-2006987)

The CRs [3][4] and [5][6] propose to clarify the UE assistance information transmission upon reconfiguration with sync. The proposed changes in these CRs are summarised as below:

Issue 1: In clause 5.3.5.3, after UE performs reconfiguration with sync, UE initiate transmission of a *UEAssistanceInformation* message in accordance with clause 5.7.4.3. However, in clause 5.7.4.3, UE sets the corresponding contents only if there is an initiation according to 5.7.4.2, without including 5.3.5.3. This may lead to inaccuracy UE assistance information. (Discussed in CRs [3][4] and [5][6])

Issue 2: After UE performs reconfiguration with sync, the UE is not restricted to send the UE assistance information with same value. However, if the UE initiates the transmission of UE assistance information message, the corresponding prohibit timer should be started or restarted which is aligned with clause 5.7.4.2. (Discussed in CRs [3][4] and [5][6])

Issue 3: After UE performs reconfiguration with sync, UE can trigger transmission of a *UEAssistanceInformation* message that was transmitted during the last 1 second before handover. Based on the current description in the specification, the following erroneous case may happen:

* UE transmits *UEAssistanceInformation* message with delay budget report during the last 1 second before handover, which satisfies condition of “if the UE transmitted a *UEAssistanceInformation* message during the last 1 second”
* UE is configured to be able to transmit overheating assistance in the target gNB, which satisfies condition of “and the UE is still configured to provide UE assistance information”
* UE can initiate the transmission of a *UEAssistanceInformation* with clause 5.7.4.3, UE transmit overheating assistance information to the target gNB but it is not transmitted to the source gNB and UE may even not have any preference for overheating.

To avoid the erroneous case above, UE can only transmit the UEAssistanceInformation with the type (i.e. delay budget report, overheating) that was transmitted during the last 1 second before handover and still configured to be able to transmit in the target gNB. (Discussed in CRs [3][4])

**Q2. Do companies agree the identified issue 1, 2 and 3 above?**

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| --- | --- | --- |
| **Company** | **Agree / Disagree** | **Comments** |
| MediaTek | Agree |  |
| Qcom | Disagree | **For issue#1:**  Based on the CR reason for change is that “the UE sets the corresponding contents if there is an initiation according to 5.7.4.2. But there is no initiation according to 5.7.4.2 as the prohibit timer is running”.  This issue can be addressed by simply stopping the T345 prohibit timer once UE determines that assistance information was transmitted 1 sec or less before ReconfigurationWithSync was triggered.  Suggested change:  *Section 5.3.5.3*  *###skipped##*  *2> if reconfigurationWithSync was included in masterCellGroup or secondaryCellGroup; and*  *2> if the UE transmitted a UEAssistanceInformation message for the corresponding cell group during the last 1 second, and the UE is still configured to provide UE assistance information for the corresponding cell group:*  *3> stop T345;*  *3> initiate transmission of a UEAssistanceInformation message for the corresponding cell group in accordance with clause 5.7.4.3;*  **For issue#2**:  This is not an issue any more once our suggested change proposed in issue#1 is used.  **For issue#3**:  We’re not sure why these cases were classified as “erroneous case”??? and we don’t see the need to restrict the UE to transmit assistance info type that was only transmitted on the source cell. If there is **a need** (given UE is configured to do so) to transmit other info type on the target cell, even if not transmitted on source cell, this info will put into good use by the target cell.  Therefore we don’t see the issue here. |
| CATT | Agree with issue 1 and 2. | Agree with the intention of issue 3.  But it is not accurate to say that UE can only transmit the *UEAssistanceInformation* with the type (i.e. delay budget report, overheating) that was transmitted during the last 1 second before handover and still configured to be able to transmit in the target gNB. For example:   * UE transmits *UEAssistanceInformation* message with overheating assistance during the last 1 second before handover, which satisfies condition of “if the UE transmitted a *UEAssistanceInformation* message during the last 1 second” * UE is configured to provide delay budget report in the handover message. * UE initiates the transmission of a *UEAssistanceInformation* according to 5.7.4.2, which satisfies condition of “the UE did not transmit a *UEAssistanceInformation* message with *delayBudgetReport* since it was configured to provide delay budget report”, no matter whether the UE initiates the transmission of *UEAssistanceInformation* with the type that was transmitted during the last 1 second before handover and still configured to be able to transmit in the target gNB.   So issue 3 can be changed to:  UE initiate the transmission of *UEAssistanceInformation* if the type (i.e. delay budget report, overheating) that was transmitted during the last 1 second before handover are still configured to be able to transmit in the target gNB. |
| vivo | Agree with issue 1 and issue 2. | For issue 3, we don’t think it is an erroneous case.  The point here is whether the UAI other than the type that was transmitted during the last 1 second before handover is allowed to be reported when target node configured to transmit:  Option1: Yes. This is the intention for CATT’s CR and QC’s suggestion.  Option2: No. This is the intention for Huawei’s CR.  In our understanding, we prefer option 1, i.e. UE not only can transmit the UEAssistanceInformation with the type that was transmitted during the last 1 second before handover, but also can transmit other UEAssistanceInformation configured by target gNB.  Thus, we prefer the change proposed by CATT or QC.  Regarding to the QC’s suggestion, we think the last change of Huawei’s CR is also needed:  1> if transmission of the *UEAssistanceInformation* message is initiated to provide a delay budget report according to 5.7.4.2 or 5.3.5.3;  2> set *delayBudgetReport* to *type1* according to a desired value;  1> if transmission of the *UEAssistanceInformation* message is initiated to provide overheating assistance information according to 5.7.4.2 or 5.3.5.3; |
| Samsung | Agree | We think that late transmission prior to node change concerns another trigger for repeating transmission of the same UE assistance, except for parts not required by target. As it thus serves the same trigger purpose as 5.7.4.2, we think it is appropriate to call 5.7.4.3 as suggested in Huawei’s CRs  We assume that intention of 3 is to clarify that in case of UAI shortly before reconfig with sync, UE merely triggers transmission of the same UE assistance if still configured to provide the concerned assistance (which we agree) |
| Nokia | Partially agree | We agree with Issue 1and 2 that can be resolved in a simple way. |
| Intel | Partially agree | Agree with issue 1 and 2. Issue 3 is not clear to us as originally mentioned. If it indeed meant CATT explanation of issue 3, that is OK. As others mention, UE should be allowed to send additional information as well in the re-tx. |
| Ericsson | Partially agree | Issue 1: agree, and this can be easily resolved by adding a reference to 5.3.5.3 in 5.7.4.3. However we have some questions:   * This should only be done for overheating and delay budget reporting, i.e. why not IDC?   *Rapporteur: Rel-15 UAI is used as an example, so there are only overheating and delay budget. For Rel-16, same logic applies.*   * The 1 sec repetition only applies when exactly the same UAI configuration is used on the source cell, i.e. this should be reflected more clearly.   Issue 2: Why should the timer be re-started, i.e. the UE repeats because the source cell may not be able to forward the UE preference, i.e. this repetition is not triggered because the UE changed its mind and we want to limit constant changes from the UE.  *Rapporteur: As it was agreed that the contents of retransmitted UAI can be different, the content can be changed for retransmission, so similar UE behaviour is re-starting the timer. Besides, the value of timer can be 0.5s, it is possible that the timer is stopped when UE retransmits the UAI to the target node, if the timer is not started, it means the UE can initiate another UAI transmission right after.*  Issue 3: We think the UE should send UE assistance according to the UAI configuration on the target. This may imply that the UE sends something different then before the HO. |
| OPPO | Agree with issue 1 and issue 2 | I do not understand the issue 3, why restrict the UE assistance type? |

**Q3. If the identified issues above are valid, do companies agree the proposed changes in CRs [3][4](Huawei) or [5][6] (CATT)?**

For Issue 1&2, both Huawei CRs and CATT CRs give the possible changes, companies are invited to provide the preference or comments on the CRs.

For Issue 3, Huawei CRs give the possible changes, companies are invited to provide the comments on the CRs.

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| **Company** | **Agree / Disagree** | **Comments** |
| MediaTek |  | We prefer the Huawei’s CRs, which seems simpler.  In addition, it seems that the following change is not necessary. The UE just provide the UE assistance information according to latest configuration.  3> initiate transmission of a *UEAssistanceInformation* message in accordance with clause 5.7.4.3 to provide UE assistance information corresponding to the content(s) transmitted in the *UEAssistanceInformation* message; |
| Qcom |  | For issue 1 & 2, We don’t agree with either approach, we provided a simpler solution. Please check Q2.  For issue 3, as we mentioned, we don’t see the issue, and need to restrict the UE to a specific behaviour, when UE is providing Assistance Information to target cell. |
| CATT | Either is OK | The two set of CRs seem to result in same intended behaviour, so either is OK with us.  It seems useful to clarify that changes proposed by CATT CRs also cover issue 3.  The difference between Huawei CRs and CATT CRs is that CATT CRs merge all initiations (including normal initiations and initiation by reconfiguration with sync) in the initiation section (i.e. 5.7.4.2). As mentioned above, the UE may initiate the transmission of *UEAssistanceInformation* upon receiving a new configuration for UE assistance information in the same *RRCReconfiguration* message. Hence, in our view it is cleaner and more straightforward to that all initiations are put together. |
| vivo |  | See above |
| Samsung |  | We do not agree to the comment from MediaTek i.e. alike Huawei we think there is a need to clarify for what info UE triggers transmission of the UAI message (alike we do for the other triggers specified in 5.7.4.2)  We addressed part of the first change in a somewhat simpler manner in R2-2007232  2> if the UE transmitted a *UEAssistanceInformation* message during the last 1 second, and the UE is still configured to provide the concerned UE assistance information:  3> initiate transmission of a *UEAssistanceInformation* message to transfer the concerned UE Assistance information in accordance with clause 5.7.4.3;  (or, if people think bullet 2 really needs to be more precise)  2> if the UE transmitted a *UEAssistanceInformation* message during the last 1 second, and the UE is still configured to provide (some of) the UE assistance information included in that message: |
| Nokia |  | R2-2006986/R2-2006987 changes UE behavior too much.  R2-2007794/R2-2007795 can be a baseline, but with the agree to:   * Second change in the CR * First change according to Samsung’s suggestion |
| Intel |  | Between the two set of CRs, we prefer the changes proposed in R2-2007794/R2-2007795. Samsung suggestion for the first change looks simpler. |
| Ericsson | Partially agree | We agree that the UE should repeat UE assistance that was send 1 sec prior to HO, when the same UE assistance is still configured on the source. We understand that the HW correction “the same content(s)”, but that is a bit unclear and confusing, because we agreed that the UE does not need to repeat the exact same message (content). |
| OPPO |  | Only agree the change for issue 1 an issue 2 part. |

**Summary**: The majority of companies (5/9) agree with the identified Issue 1 and Issue 2, but not the Issue 3, MediaTek, Samsung also agree with the identified Issue 3 and two companies prefers Samsung’s suggestion for the first change. Several companies (4/9) think the CRs R2-2007794/R2-2007795 can be a baseline with some updates to simplify the changes and improve the wording.

Rapporteur views: The majority of companies share the view that not only the assistance info transmitted during the last 1 second before handover (if configured by the target node) can be retransmitted to the target node, but also the other UAI (if configured by the target node) is allowed to be reported after handover to the target node. I understand it is the main concern for Issue 3. However, the intention of CRs R2-2007794/R2-2007795 is to clarify what assistance info UE triggers transmission of the UAI (as Samsung points out). After handover to the target node, the UAI transmission is summarized:

* the UE initiates transmission of UAI that transmitted during the last 1 second before handover (if configured by the target node), that is, UE sets the contents of UAI as in 5.7.4.3 according to the trigger of handover in 5.3.5.3
* the UE can initiate transmission of other UAI (if configured by the target node), that is, UE sets the contents of UAI as in 5.7.4.3 according to the trigger of UE preference in 5.7.4.2

Thus, based on current spec, transmitting other UAI after handover to the target node is not preclude, UE always can trigger the UAI transmission based on current preference if configured according to 5.7.4.2.

Thus, rapporteur suggests to continue to discuss the CR to address the Issue 1 and 2, and further discuss if it is necessary to address the Issue 3 (Samsung agrees with the identified Issue 3 and two companies prefers Samsung’s suggestion, so rapporteur understands there are some supports). The R2-2007794/R2-2007795 can be a baseline with taking Samsung’s wording suggestion into account.

**Proposal 2: Continue to discuss the CRs in part 2 to address at least the Issue 1 and Issue 2. The CRs R2-2007794/R2-2007795 can be a baseline with taking Samsung’s wording suggestion into account.**

# Conclusion

R2-2007792/R2-2007793:

**Proposal 1: The contents of CRs in R2-2007792/R2-2007793 are agreed, and are merged into 38.331 Rapporteur CR.**

R2-2007794/R2-2007795, R2-2006986/R2-2006987:

**Proposal 2: Continue to discuss the CRs in part 2 to address at least the Issue 1 and Issue 2. The CRs R2-2007794/R2-2007795 can be a baseline with taking Samsung’s wording suggestion into account.**

# Reference

1. R2-2007792 Correction on condition of stopping overheating prohibit timer Huawei, HiSilicon CR Rel-15 38.331 15.10.0 1905 - F NR\_newRAT-Core
2. R2-2007793 Correction on condition of stopping overheating prohibit timer Huawei, HiSilicon CR Rel-16 38.331 16.1.0 1906 - A NR\_newRAT-Core
3. R2-2007794 Correction on UE assistance information transmission for handover case Huawei, HiSilicon CR Rel-15 38.331 15.10.0 1907 - F NR\_newRAT-Core
4. R2-2007795 Correction on UE assistance information transmission for handover case Huawei, HiSilicon CR Rel-16 38.331 16.1.0 1908 - A NR\_newRAT-Core
5. R2-2006986 Further correction on UEAssistanceInformation upon reconfiguration with sync CATT CR Rel-15 38.331 15.10.0 1759 - F NR\_newRAT-Core
6. R2-2006987 Further correction on UEAssistanceInformation upon reconfiguration with sync CATT CR Rel-16 38.331 16.1.0 1760 - F NR\_newRAT-Core