3GPP TSG-RAN WG2 Meeting #109e R2-200xxxx

Elbonia, Online, 24 February – 6 March 2020

**Agenda item: 6.9.3.6**

**Source: Samsung (Offline rapporteur)**

**Title: Offline discussion 214: Fast handover failure recovery**

**Document for: Discussion and Decision**

# 1 Introduction

* [AT109e][214][NR MOB] Finalization of T312 for fast handover failure recovery (Samsung)

Scope:

* + - Agreeing on the proposals as per [R2-2002070](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109_e/Docs/R2-2002070.zip).
    - Discuss open items as per [R2-2002070](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109_e/Docs/R2-2002070.zip) to seek companies feedback on open issues NR T312.

Intended outcome:

* + - Proposals with consensus that can be incorporated (if needed) in the running CR(s) (aim to agree to those over email)
    - List of remaining open issues that need to be pursued in next meeting (if any).
    - Issues that should no longer be pursued

Deadline for providing comments and for rappporteur inputs:

* + - Companies input: Thursday, Feb. 27th 3:00 CET
    - Rapporteur proposals: Friday, Feb. 28th 12:00 CET
    - Comments on proposals’ wording, Monday March 2nd by 17:00 CET

# 2 Progressing on the Summary Report ([R2-2002070](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109_e/Docs/R2-2002070.zip))

**Agreements proposed to be agreed in this meeting**

**Recommended Proposal#1: RAN2 is requested to agree the proposals in [**[**R2-2000928**](http://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109_e/Docs/R2-2000928.zip)**] and adopt in running CR the proposed TP.**

**Q1: Do you agree to the recommended proposal#1?**

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| --- | --- | --- |
| **Company** | **[YES/NO]** | **If you object Proposal#1, then please provide the technical reason for objection** |
| OPPO | YES |  |
| Apple | Yes |  |
| Samsung | Yes |  |
| Sharp | Yes |  |
| Intel | Yes |  |
| CATT | Yes | We wonder Whether we can specify that upon T310 stop, the T312 should be stopped? |
| ZTE | Yes |  |
| Nokia | Yes | But do we need to cover those scenarios separately? As Sharp observed (Observation 2 in R2-2000928), T310 will be stopped then. And T312 does not run when T310 is not running. So all boils down to: T312 is not running whenever T310 is not running? |
| Huawei, HiSilicon | Yes |  |
| vivo | Yes |  |
| Ericsson |  | It seems ok. |

**Recommended Proposal#2: RAN2 is requested to quickly check the two alternatives proposed in [**[**R2-2001623**](http://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109_e/Docs/R2-2001623.zip)**] and agree one of them.**

**Q2: Do you agree to the recommended proposal#2?**

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| --- | --- | --- |
| **Company** | **[YES/NO]** | **If you agree with Proposal#2, please indicate the alternative you prefer and why?** |
| Apple | Yes | We prefer Alt 1, since it’s simpler than Alt 2. |
| Samsung | Yes | Both alternatives work. However, we prefer Alt 1 as it is simpler. We think it is fine in principle to use the undefined code point. |
| Lenovo | No | Neither of the 2 alternatives are acceptable:   * Alt1 is not backwards-compatible. * Alt2 by introducing new IE FailureReportSCG-NR-r16 creates unnecessary redundancy since it is mostly a copy of FailureReportSCG-NR-r15. |
| Sharp | No | We prefer Alt 3 proposed by Lenovo as below. |
| Intel | Yes | Same view as Samsung. Alt 1 is simpler and should be ok to use the undefined code point. |
| CATT |  | Alt 1 or Alt 3 |
| ZTE |  | Alt 1 or Alt 3 |
| Samsung 2 |  | This is just to respond to ALT3 proposed by Lenovo. The issue we have with this approach is that *failureType-r15* is not an optional feature. Therefore the Ue always have to report *failureType-r15* even if the failure is due to *failureType-r16.* (We don’t think it is the expected behavior although this is how we defined for LTE DC) |
| Nokia | No | Agree with Lenovo. |
| Huawei, HiSilicon | Yes | Both alternatives work. |
| Lenovo 2 |  | This is the response to “Samsung 2” above. Yes, unfortunately failureType-r15 was defined as mandatory present and Alt3 requires the UE to send failureType-r15 as well if the optional field failureType-v16xy is present. But we don’t see it as a critical issue. We can address this issue by introducing a field description for failureType with e.g. the following text:  “If failureType (with suffix) is reported, E-UTRAN ignores failureType (without suffix)”.  This approach has been widely used in 36.331 for DL signaling to ensure backwards-compatibility. |
| Vivo | Yes | We prefer Alt 1, since it’s simpler.  We also would like to check what will happen in Atl3 if a R16 UE re-establishes to a R15 gNB after T312 expires. It seems the R15 gNB will be misled by the failureType-r15 reported by UE for the UE includes the real failure type(i.e. t312-Expiry-v16xy) in failureType-v16xy. |
| MediaTek | Yes | We prefer Alt 1 for its simplicity. |
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Companies can provide view if they object the proposal

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| --- | --- |
| **Company** | **If you object Proposal#2, then please provide the technical reason for objection** |
| OPPO | Since T312 expiry means early T310 expiry, we wonder whether UE can reuse the code point of t310-Expiry for reporting SCG failure. |
| Lenovo | New Alt3 is proposed where the new failure type t312-Expiry-v16xy is introduced as Rel-16 NCE of failureType-r15 as shown below in red font color.  FailureReportSCG-NR-r15 ::=     SEQUENCE {      failureType-r15                    ENUMERATED {                                            t310-Expiry, randomAccessProblem,                                            rlc-MaxNumRetx,                                            synchReconfigFailureSCG, scg-reconfigFailure,                                            srb3-IntegrityFailure},      measResultFreqListNR-r15               MeasResultFreqListFailNR-r15        OPTIONAL,      measResultSCG-r15                      OCTET STRING                       OPTIONAL,      ...,      [[ failureType-v16xy               ENUMERATED {t312-Expiry-v16xy}          OPTIONAL      ]]  } |
| Sharp | Alt 3 above is preferred. |
| Nokia | Alt 3 is OK |
|  |  |

**Open items proposed to be further discussed in this meeting**

**DISC S1\_1:** Whether configuration of T312 in the CHO event configuration is allowed? If allowed, then the trigger condition to start T312 **[**[**R2-2001609**](http://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109_e/Docs/R2-2001609.zip)**]**.

**Q3: Whether configuration of T312 in the CHO event configuration i.e. CHO-TriggerConfig-r16 is allowed?**

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| --- | --- | --- |
| **Company** | **[YES/NO]** | **Please provide technical justification** |
| OPPO | NO | CHO event configuration is not used for measurement reporting and we fail to understand how T312 can improve CHO execution. |
| Apple | No | T312 mechanism is to avoid the missing of measurement report transmission and HO command reception.  For CHO, there is no the measurement report transmission and no HO command reception during the CHO execution phase, then the T312 cannot bring any benefit. |
| Samsung | Yes | We think T312 can complement failure handling for CHO and can be introduced to CHO event configuration i.e. T312 does not hinder with the CHO execution procedure.  Currently, when RLF occurs for a UE configured with CHO and attemptCHO, it performs CHO execution if cell selected is a CHO candidate, or RRE otherwise.  While CHO candidate evaluation, it is possible that on expiry of TTT, candidate cell does not fulfil the entry. In such cases, we think we can use T312 to recover from RLF faster. |
| Sharp | No | We think it is sufficient to rely on current T312 behaviour for fast RLF declaration, and cannot understand the benefit of T312 in the CHO event configuration. |
| Intel | No | We would like to understand what motivation is to support this, considering the failure can be avoided by setting proper threshold for CHO events. |
| CATT | No | The current T312 mechanism can work well. We would like to understand what is broken in the spec. |
| ZTE | No | We share the same view with Sharp and CATT. |
| Samsung 2 | - | 1. T312 can be configured for normal eventTriggered configurations. In order to use T312 for declaring fast RLF for CHO configured UE, it is required that the same measurement object has to be configured with normal event as well as CHO event I,e, normal event with T312, and CHO event without T312. Now, UE can start T312 when MR is triggered for the normal event.    1. If CHO is used as a fallback to normal handover, then T312 will be started before CHO execution (if T310 is running). This impacts CHO execution. network chose to not configure T312 on a UE configured with CHO.    2. If normal HO is used as a fallback to CHO, then T312 may never be started. If CHO candidate does not fulfil the entry condition on expiry if its TTT, then CHO is not executed. Therefore, there is no mechanism to declare fast RLF. |
| Nokia | No | T312 is used to declare early RLF. Why to configure that in the event for CHO execution? Does not seem to make sense… |
| Huawei, HiSilicon | No | Do not see the value of doing this. |
| vivo | No | When T312 expires, RLF will be declared and the RRC re-establishment procedure is triggered. The UE can select a proper cell for reestablishment according to the cell selection criterion and the measurement result already obtained while T312 is started. Then CHO will be performed if the cell selected for reestablishment is a candidate target configured for CHO.  Hence, what is improved by the proposal compared to the current UE behaviour is the cell selection procedure is skipped. But given measurement results are already available while T312 is started, we assume the UE will finish the cell selection in a very short time. The benefit of the proposal seems very limited. |
| MediaTek | No |  |
| Ericsson | No | Following the guidelines from chairman we should avoid adding stuff that is not necessary at the moment. This is an optimization, CHO already has some additional layer to avoid RLF, adding that would be yet another one. I wonder what kind of deployments people have in mind. |

If your answer to Q3 is YES, such configuration should be allowed for both LTE and NR?

**Q4: Whether configuration of T312 in the CHO event configuration i.e. CHO-TriggerConfig-r16 is allowed for both LTE and NR?**

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| **Company** | **[YES/NO]** | **Please provide technical justification** |
| Samsung | Yes | It can be supported for both NR and LTE |
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If your answer to Q3 is YES, such configuration should be allowed for both CHO and CPC?

**Q5: Whether configuration of T312 in the CHO event configuration i.e. CHO-TriggerConfig-r16 is allowed for both CHO and CPC ?**

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| **Company** | **[YES/NO]** | **Please provide technical justification** |
| Samsung | Yes | We see no issue in supporting it for both CHO And CPC |
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If your answer to Q3 is YES, then the trigger condition to start T312 need to be specified.

**Q4: Do you agree with P2 from [**[**R2-2001609**](http://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109_e/Docs/R2-2001609.zip)**]? If no, then specify the trigger condition**

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| --- | --- | --- |
| **Company** | **[YES/NO]** | **If no, then specify the trigger condition** |
| Samsung | Yes | We propose to start T312 after the TTT of a CHO candidate is expired i.e. trigger condition for starting T312 is only after CHO execution condition is not fulfilled. Therefore, there is no impact to CHO execution  If the serving cell does not recover during TTT of the CHO candidate + T312 duration, we think it is better to declare RLF faster and recover either through CHO execution (if 'attemptCHO' is configured) or through RRE. Waiting for T310 to expire/ other candidate cell to fulfil condition does not really help the user. |
| Nokia | No | Regarding P2 from R2-2001609: the assumption is that entry condition is checked at the beginning and end of TTT. While it shall be checked continuously and whenever this is not fulfilled, TTT is stopped. And no need to trigger RLF when CHO was not executed for a single candidate cell (as the entry criteria were not fulfilled for the duration of TTT), even if T310 is already running. The source cell may still recover, or another candidate cell may trigger. |
| Ericssson | No | In our view we don’t need too many layers of optimizations for recovery, we already have the CHO upon RLF, which is a quite good solution. |

# 3 Rapporteur Summary

[TBD]

# 4 List of referenced documents

[1] [R2-2002070](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109_e/Docs/R2-2002070.zip) Summary of AI 6.9.3.4 (Fast handover failure recovery) Samsung .

[2] [R2-2000928](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109_e/Docs/R2-2000928.zip) T312 handling in NR Sharp discussion

[3] [R2-2001623](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109_e/Docs/R2-2001623.zip) Introduction of T312 for NR PSCell in (NG)EN-DC Samsung CR Rel-16 36.331 15.8.0 4227 - B NR\_Mob\_enh-Core

[4] [R2-2001609](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109_e/Docs/R2-2001609.zip) Discussion on T312 support in CHO events Samsung