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

Elbonia, Online, 20 – 30 April 2020

**Agenda item: 6.9.3.2**

**Source: Samsung (Offline rapporteur)**

**Title: Offline discussion 208: Finalization of T312 for Fast handover failure recovery**

**Document for: Discussion and Decision**

# 1 Introduction

* [AT109bis-e][208][NR MOB] Finalization of T312 for fast handover failure recovery (Samsung)

Scope:

* + - Discuss the topics raised by contributions in AI 6.9.3.2 to see which issues need to be resolved in Rel-16.

Intended outcome:

* + - Discussion summary document in [R2-2003848](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003848.zip)
    - Agreeable proposals for closing critical open issues (if possible).
    - Non-critical issues that should no longer be pursued in Rel-16

Deadlines for providing comments and for rappporteur inputs:

* + - Initial deadline (for companies' feedback): Thursday 2020-04-23 12:00 UTC
    - Initial deadline (for rapporteur's summary in [R2-2003848](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003848.zip)): Friday 2020-04-24 12:00 UTC
    - Proposed agreements in [R2-2003848](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003848.zip) indicated for email agreement and not challenged until Tuesday 2020-04-28 12:00 UTC will be declared as agreed by the session chair.

# 2 Brief scope of the remaining issues of T312 handling

This document contains the analysis of below listed Tdoc from agenda item 6.9.3.2 (Open issues and corrections for fast handover failure recovery).

|  |  |  |  |
| --- | --- | --- | --- |
| **Sr. No** | **TDoc** | **Title** | **Source** |
| [1] | [R2-2003578](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003578.zip) | Discussion on T312 support | Huawei, HiSilicon |
| [2] | [R2-2002599](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2002599.zip) | Discussions on VarRLF-Report Setting | Quectel |
| [3] | [R2-2002901](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2002901.zip) | Failure handling of both CHO and MR-DC | LG Electronics Inc. |
| [4] | [R2-2003036](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003036.zip) | Failure handling interaction | Ericsson |

The issue raised in [2] does not concern the recovery functionality based on T312. It seems to an ASN.1 issue and should be addressed by AI 6.9.5 (ASN.1 review of mobility WIs for NR RRC). Therefore, this issue is not further discussed in this offline discussion.

The issues raised in [3] and [4] concern the simultaneously configuration of CHO recovery and MCG fast recovery. This was discussed in email discussion in context of Q6 in [Post109e#12][MOB] Resolving open issues for CHO (Nokia). It is expected the email discussion report [[R2-2003105](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003105.zip)] submitted to agenda item 6.9.3.1 will handle this issue and after treatment if any further aspect need to be discussed will be handled by offline discussion [AT109bis-e][207][MOB] Resolution to open issues for CHO (Nokia). Therefore, this issue is not further discussed in this offline discussion.

There are some minor issues raised in [1] concerning the T312 handling. Therefore, this offline discussion is focussed on handling the remaining minor issues.

2.1 Remaining issues from [[R2-2003578](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003578.zip)]

**Issue#1: Stopping T312 on receiving *reconfigurationWithSync***

It is pointed out that TS 38.331 v16.0.0, captures the start/stop conditions for timer T312 as shown below.

|  |  |  |  |
| --- | --- | --- | --- |
| Timer | Start | Stop | At expiry |
| T312 | If T312 is configured in MCG: Upon triggering a measurement report for a measurement identity for which T312 has been configured, while T310 in PCell is running.  If T312 is configured in SCG: Upon triggering a measurement report for a measurement identity for which T312 has been configured, while T310 in PSCell is running. | Upon receiving N311 consecutive in-sync indications from lower layers for the SpCell, receiving *RRCReconfiguration* with *reconfigurationWithSync* for that cell group, upon initiating the connection re-establishment procedure, and upon the expiry of T310 in corresponding SpCell.  Upon SCG release, if the T312 is kept in SCG | If the T312 is kept in MCG: If security is not activated: go to RRC\_IDLE else: initiate the connection re-establishment procedure.  If the T312 is kept in SCG, Inform E-UTRAN/NR about the SCG radio link failure by initiating the SCG failure information procedure.as specified in 5.7.3. |

However, it is argued in [1] the stopping of T312 upon reception of *reconfigurationwithSync* is missing in the procedural text of clause 5.3.5.3. Extract of sub-clause 5.3.5.3 fromTS 38.331 v16.0.0 that is cited in [1] is shown below

|  |
| --- |
| 5.3.5.3 Reception of an *RRCReconfiguration* by the UE The UE shall perform the following actions upon reception of the *RRCReconfiguration,* or upon execution of the conditional configuration (CHO or CPC):  **……**  **……**  1> if *reconfigurationWithSync* was included in *spCellConfig* of an MCG or SCG, and when MAC of an NR cell group successfully completes a Random Access procedure triggered above;  2> stop timer T304 for that cell group;  2> stop timer T310 for source if running;  2> apply the parts of the CSI reporting configuration, the scheduling request configuration and the sounding RS configuration that do not require the UE to know the SFN of the respective target SpCell, if any;  2> apply the parts of the measurement and the radio resource configuration that require the UE to know the SFN of the respective target SpCell (e.g. measurement gaps, periodic CQI reporting, scheduling request configuration, sounding RS configuration), if any, upon acquiring the SFN of that target SpCell; |

This is actually not correct because the actions upon reception of *reconfigurationwithSync* is specified in sub clause 5.3.5.5.2, which is called from 5.3.5.5 which gets called from 5.3.5.3. The sub-clause 5.3.5.5.2 is cited below, which shows that the timer T312 is stopped upon reception and executing the *reconfigurationwithSync*

|  |
| --- |
| 5.3.5.5.2 Reconfiguration with sync The UE shall perform the following actions to execute a reconfiguration with sync.  1> if the AS security is not activated, perform the actions upon going to RRC\_IDLE as specified in 5.3.11 with the release cause '*other*' upon which the procedure ends;  1> if *dapsConfig* is not configured for any DRB:  2> stop timer T310 for the corresponding SpCell, if running;  1> stop timer T312 for the corresponding SpCell, if running;  1> start timer T304 for the corresponding SpCell with the timer value set to *t304*, as included in the *reconfigurationWithSync*; |

**Q1: Do companies agree with the issue raised w.r.t missing text in 5.3.5.3 is not valid but covered in 5.3.5.5.2?**

|  |  |  |
| --- | --- | --- |
| **Company** | **[YES/NO]** | **Comments (if any)** |
| Samsung | Yes | The issue seems invalid. Upon, receonfigurationWithSync, T310 and T312 are stopped for CHO, CPC and legacy HO, as seen in 5.3.5.5.2. Therefore, there is no instance of T310 and T312 running that needs to be stopped upon completing random access on the target cell.  For DAPS, RAN2 agreed that T310 will not be stopped upon reconfigurationWithSync, and is stopped after random access to target cell. Whether T312 should continue upon reconfigurationWithSync (similar to T310) is being discussed as part of email#11 (Q-2.4.1, proposal S2.4) and needs to be discussed there. |
| Intel | Yes | Agree with Samsung. |
| Nokia | Yes | Agree with the explanation provided by Samsung. |
| OPPO | Yes |  |
| ZTE | Yes | Agree with Samsung. |
| LG | Yes |  |
| Qualcomm | Yes |  |
| Futurewei | Yes |  |
| Lenovo | Yes | Agree with Samsung |
| Sharp | Yes |  |
|  |  |  |
|  |  |  |

Then w.r.t to the green highlighted text in 5.3.5.3, it is for the case when UE has completed RA in the target cell in case of DAPS HO and UE stops the timer T310 in the source cell. In email discussion [Post109e#11][MOB], Question 2.4-1 address the issue whether T312 in source is stopped in DAPS HO. Based on majority view the rapporteur (Intel) proposed “*Proposal S2.4: T312 in source is stopped upon executing a reconfiguration with sync even if DAPS is configured; No specificiation impact.*” Therefore, it is suggested this issue is handled with the treatment of [Post109e#11][MOB] email discussion report and if the rapporteur proposal is agreed there is no specification impact.

**Issue#2: Applicability of CHO agreements in context of T312 to be applicable to CPC**

It is pointed out the following agreements were made at RAN2-109-e meeting.

* 18: T312 is not stopped upon the reception of RRC Reconfiguration with cho-Config; Do not need additional change.
* 19: T312 is stopped upon the execution of CHO; Do not need to change specification.
* 20: CHO based RLF failure handling is also applied for RLF caused by the expiry of T312; Do not need to change specification.

The proponent observes that agreements #18 and #19 are applicable to CPC.

**Q2: Do companies agree with the observations that agreements #18 and #19 are applicable to CPC?**

|  |  |  |
| --- | --- | --- |
| **Company** | **[YES/NO]** | **Comments (if any)** |
| Samsung | Yes |  |
| Intel | Yes |  |
| Nokia | Yes |  |
| OPPO | Yes |  |
| ZTE | Yes |  |
| LG | Yes |  |
| Huawei, HiSilicon | Yes |  |
| Qualcomm | Yes |  |
| Futurewei | Yes (conditional) | 18, 19 can be applied to that the T312 is running at the source PSCell for CPC. If it is running at the PCell, it should not be affected by CPC actions. |
| Lenovo | Yes |  |
| Sharp | Yes |  |

However, the proponent does not provide any text proposal if the answer to Q3 is YES. The reason may be that CHO and CPC procedures are handled uniformly in TS 38.331. Since #18 and #19 do not impact the specs for CHO configuration/execution implicitly it does not impact the specs for CPC configuration/execution.

**Q3: Even if answer to Q2 is YES, do companies agree that there is no specification impact?**

|  |  |  |
| --- | --- | --- |
| **Company** | **[YES/NO]** | **Comments (if any)** |
| Samsung | Yes |  |
| Intel | Yes |  |
| Nokia | OK |  |
| OPPO | Yes |  |
| ZTE | Yes |  |
| LG | Yes |  |
| Huawei, HiSilicon | Yes |  |
| Qualcomm | Yes to #1 and #2 | In 38.331, *attemptCondReconfig* handling seems to be only for MCG. |
| Futurewei | Yes |  |
| Lenovo | Yes |  |
| Sharp | Yes |  |

**Issue#3: Uniformity of text concerning stopping of T312**

The last issue concerns the uniformity of text concerning stopping of T312 in different sub-clauses. The referenced sub-clauses in [1] as shown below.

|  |
| --- |
| **5.3.5.5.6 RLF Timers & Constants configuration** 2> else:  3> (re-)configure the value of timers and constants in accordance with received *rlf-TimersAndConstants*;  3> stop timer T310 for this cell group, if running;  3> stop timer T312 for this cell group, if running;  3> reset the counters N310 and N311. **5.3.5.5.7 SpCell Configuration** 2> if any of the reference signal(s) that are used for radio link monitoring are reconfigured by the received *spCellConfigDedicated*:  3> stop timer T310 for the corresponding SpCell, if running;  3> stop timer T312 for the corresponding SpCell, if running;  3> reset the counters N310 and N311. **5.3.7 RRC connection re-establishment****5.3.7.2 Initiation** Upon initiation of the procedure, the UE shall:  1> stop timer T310, if running;  1> stop timer T312, if running;  1> stop timer T304, if running; |

It is argued that the non-uniform handling of stopping the timer T312 in the above referenced sub-clauses lead to ambiguities on UE behaviour. It is proposed to change the text to uniform description that the UE shall stop timer T312 for the corresponding SpCell, if running.

**Q4: Do companies agree with the argument that the stopping the timer T312 in the above referenced sub-clauses lead to ambiguities on UE behaviour?**

|  |  |  |
| --- | --- | --- |
| **Company** | **[YES/NO]** | **Comments (if any)** |
| Samsung | No | T312 handling (start/ stop of T312 on a cell/ cell group) has to be similar to that of T310. In the current specification, T312 handling is aligned to T310 handling which is specified from release 15 itself and we think it is clear. Any change for T312 alone will create ambiguity for the UE. |
| Intel | No | Same view as Samsung. It would be good to align with T310 handling in the same section. |
| Nokia | No | It is true that T312 is associated differently in the quoted excerpts (‘for this cell group’ or ‘for the corresponding SpCell’), but as pointed out by Samsung and Intel, it is linked to T310 and referred to in the same way as T310. Thus, no critical need to align the procedural text. |
| OPPO | No | Agree with above comments. Intention is to align with the wording of T310. |
| ZTE | No | Agree with above comments. |
| LG | No | Agree with above comments. |
| Huawei, HiSilicon | No | We can understand the point that T312 handling is following T310 handling, and most of companies do not see critical issues for it. So we are fine to keep the current text. |
| Qualcomm | No | RRC spec is full of such usage of different terms in different places. Maybe not ideal editorially but it doesn’t cause any technical issue. |
| Futurewei | No |  |
| Lenovo | No |  |
| Sharp | No | There is no ambiguity, both terms can be kept. |
|  |  |  |
|  |  |  |

If majority answers to Q1, Q2 and Q3 is YES and answer to Q4 is NO, then it can be argued that there are no more open issues for T312 handling. Further, it can also be noted that there are no specification impacts due to the 3 issues raised in [1]. There may be possibility that some ASN.1 issues may arise in future but it is expected that those issues should be raised in the Phase 2 of ASN.1 review.

**Q5: Do companies agree that there are no specification impacts due to the 3 issues raised in [1]?**

|  |  |  |
| --- | --- | --- |
| **Company** | **[YES/NO]** | **Comments (if any)** |
| Samsung | Yes |  |
| Intel | ? | Not quite sure whether RIL should be counted as well? So far Z269, Z270 and C003 are related to T312. |
| Nokia |  | If the question concerns [1] only then Yes. |
| ZTE |  | If the question concerns [1] only then Yes. |
| LG |  | We don’t understand what is different from Q3. |
| Sharp | Yes | We understand this question only concerns issues in [1] |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

# 3 Rapporteur Summary [TBD]