3GPP TSG-RAN WG2 Meeting #109bis-e draftR2-200xxxx

Elbonia, Online, 20 – 30 April 2020

**Agenda item: 6.9.3.1**

**Source: Nokia, Nokia Shanghai Bell**

**Title: Report from [AT109bis-e][207][MOB] Open CHO issues**

**WID/SID: LTE\_feMob-Core/NR\_Mob\_enh-Core - Release 16**

**Document for: Discussion and Decision**

# 1 Brief scope of the paper

This document aims at collecting companies’ views regarding the open issues for Conditional Handover (CHO), submitted to 6.9.3.1 for RAN2#109bis-e (held in Elbonia, April 2020). Please beware that TDocs discussing the aspects handled in [3] are not included below, as the e-mail discussion report shall be handled first!

# 2 Discussion

## 2.1 T304 running when CHO condition execution is met

The authors of [1] insist on clarifying that CHO shall not be executed if there is already any other ongoing HO (e.g. legacy HO was initiated while the UE still evaluates CHO conditions and decides to execute CHO when HO is ongoing). Due to this problem, the authors of [1] suggest to associate the CHO execution with the condition which checks if the T304 is already running. This idea was already brought up and discussed briefly during RAN2#109 and not captured in the specification. While this is logical that T304 shall not be running when UE triggers CHO, it is a separate question if this behaviour needs to be explicitly captured in the specification. Thus, please respond to the following question.

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| **Question 1: Should the RRC procedure be extended with a condition checking if T304 is running before UE executes conditional reconfiguration?** | | |
| **Company** | **YES/NO** | **Comment** |
| MediaTek | No | We agreed to have recovery via CHO for mobility failures, which implies that UE may continue evaluating CHO execution conditions during HO/CHO, if possible. In normal cases, when T304 is running, UE does not execute CHO to another candidate, but we may find it useful in later UE implementation, and thus we don’t want to have it explicitly banned in the specifications. |
| OPPO | Yes | We think checking T304 makes sense when initiating CHO execution. |
| Intel | No | It is related to whether the UE can continue the evaluation of execution condition during HO. We do not see the use case for it, and if the UE stops the evaluation of execution condition, then the condition will not be met when T304 is running. |
| Lenovo | Yes | We slightly prefer to make it clear. |
| Panasonic | - | We are either fine with this T304 approach as well as the solution suggested by Ericsson in [3]. However, if no consensus is possible we prefer to not capture anything in the spec and avoid discussing the same thing again and again. |

## 2.2 Corrections to conditional reconfiguration evaluation

The authors of [2] argue the procedure for evaluating the measurement events for triggering conditional reconfiguration (5.3.5.13.4 in TS 38.331) should be extended. It is proposed to add a statement initializing the procedure, to make sure the condition is not fulfilled when the procedure is started. In addition, it is proposed to prevent the UE from checking the leaving condition all the time even if the entry condition was not fulfilled earlier. The authors of [2] have brought the same topic to [Post109bis-e#12], report in [3]. Several companies found those changes unnecessary. However, no proper discussion happened. Thus, companies are now invited to express their opinions.

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| **Question 2: Do you think the RRC procedure in 5.3.5.13.4 should be extended with additional subclauses to make sure the condition is not fulfilled/leaving condition is not checked when unnecessary, as suggested in [2]?** | | |
| **Company** | **YES/NO** | **Comment** |
| MediaTek | Yes/No | We believe that the default state of a triggering event is “not fulfilled”, and we need not to specify explicitly. Otherwise we should do this also for all measurement events?  But we are fine to have “if this event is considered as being fulfilled before, and” in [2]. |
| OPPO | No | We don’t understand why this issue is specific to CHO execution conditions, given that legacy measurement event works well in the same way? |
| Intel | No | Do not see the reason why such changes are needed. |
| Lenovo | No |  |
| Panasonic | Yes | In the measurement framework, when a triggering event is fulfilled, a measurement reporting entry will be added into *VarMeasReportList*. Here the CHO event uses a different approaching by assigning “not fulfilled” and “fulfilled” states. We simply want to avoid the situation where a new variable is declared but no value is assigned to that variable (to avoid some debugging issues).  Also, it is clear in the measurement framework that the UE will not check the leaving condition of a triggering event, if this event is not fulfilled before (not being added into *VarMeasReportList* before). However, according to the current spec the UE has to always check the leaving condition of a CHO triggering event. |

## 2.3 CHO and MR-DC operation

The authors of [4] describe the possible consequences of allowing CHO in MR-DC and MR-DC after CHO is configured. Such aspects need to be considered as the majority in [3] seem to favour no SCG configuration in Conditional Reconfiguration, so MR-DC needs to be released at certain point during CHO. The authors of [4] propose the UE releases MR-DC upon the execution of CHO (Proposal 1). In addition, it is suggested source MN releases source SN upon reception of Handover Success from the target MN (Proposal 3 and 4). Do companies agree with such approach?

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| **Question 3: Do you agree UE releases MR-DC upon the execution of CHO and MN releases source SN upon reception of Handover Success from the target MN?** | | |
| **Company** | **YES/NO** | **Comment** |
| MediaTek | Yes | This is reasonable UE behaviour if we agree to have no SCG configuration in Conditional Reconfiguration. |
| OPPO | We prefer network-based approach for releasing MR-DC | We would like to understand the proposal a bit further.   1. Does it mean UE autonomously releases MR-DC? or 2. Does CHO configuration include a MR-DC release command?   We don’t want to have UE autonomous MR-DC release and we think it would be enough to have network-based solution, i.e. including MR-DC release explicitly in CHO configuration. |
| Intel | No | It should be released by network. |
| Lenovo | Yes | We have agreed that CHO configuration is allowed to be configured for UE with MR-DC. In addition, CHO including SCG configuration is not supported. Therefore, it is reasonable to autonomously release SCG when UE executes CHO. |
| Panasonic | Yes | We agree that UE can release the MR-DC upon the execution of CHO (if the conditional reconfiguration doesn’t carry the SCG configuration). The source node anyway will release all UE’s configurations (including SCG configuration) upon receiving the Hanover Success indication from target node. |

The authors of [4] also suggest to suspend CHO when SCG addition is received (Proposal 6). However, that seems to be a sort of enhancement and can be circumvented by cancelling CHO and configuring it again, if necessary. We suggest not to handle this or any other proposals from [4].

## 2.4 Source reconfiguration during CHO

The authors of [5] claim that Stage 2 specification shall be updated with a NOTE, explaining that source gNB is allowed to reconfigure the UE even after CHO configuration for candidate target cells. In addition, the NOTE shall say it is up to network to update the UE stored CHO configurations so that they remain valid. Such NOTE does not seem to be critically needed, but we would like the companies to express their opinion.

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| **Question 4: Do you think TS 38.300, section 9.2.3.4.2 should be updated with a NOTE that source gNB can reconfigure the UE even after providing CHO configuration for candidate target cells and it is NW’s responsibility to ensure those configurations remain valid (as proposed in [5])?** | | |
| **Company** | **YES/NO** | **Comment** |
| MediaTek | Yes | This NOTE is not critically needed, but we’d like to have it as a clarification. |
| OPPO | Yes | We are ok with the NOTE since this reflects earlier RAN2 agreements on NW behaviour. |
| Intel | No | Do not see the strong need to have such NOTE in stage 2. |
| Lenovo | No | As discussed in the email discussion, gNB may release CHO configuration and reconfigure the CHO based on the acknowledge from target cell. We don’t see the necessity to add a note since it is network implementation. |
| Panasonic | Yes | Although we also agree it is not critically needed. |

## 2.5 UE configuration release in RRC Reestablishment

The authors of [6] discuss UE’s behaviour when RRC Reestablishment is performed. It is described that as per legacy, the UE releases its configuration including spCellConfig, MCG SCell and otherconfig (delayBudgetReportingConfig and overheatingAssistanceConfig). In [6] it is proposed to change this behaviour if the UE is configured with *conditionalReconfiguration*. We do not fully understand the motivation behind this proposal and wonder if the intention was perhaps to associate it with the *attemptCondReconfig*, not the *conditionalReconfiguration*? Anyway, do companies share the proposal brought by Sharp in [6]?

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| **Question 5: Do you think the UE shall not release otherconfig including delayBudgetReportingConfig and overheatingAssistanceConfig and MCG SCells if the UE was configured with conditionalReconfiguration and the selected cell is a CHO candidate cell (as proposed in [6])?** | | |
| **Company** | **YES/NO** | **Comment** |
| MediaTek | Yes? | We are not sure if the configuration misalignment described in [6] will happen.  In the endorsed RRC CR (R2-2001767), we already identify that “release spCellConfig” and “suspend all RBs, except SRB0” should not be done in the initiation part if UE is configured with *conditionalReconfiguration*, and they will be done later if the selected cell is not CHO candidate.  If the *delayBudgetReportingConfig*, *overheatingAssistanceConfig* and MCG SCells also have the same problem, we should treat them in the same way as the previous two, i.e., associated with *conditionalReconfiguration* instead of *attemptCondReconfig*, and the text proposal in [6] can be used. |
| OPPO | Yes | Since delta configuration can be used for CHO configuration, then for UE to be able to acquire the entire target configuration upon CHO execution, e.g. in case of recovery via CHO, these source configurations should not be released. |
| Intel | Yes | This is same as PSCell configuration,etc that can be used as baseline for delta signalling in CHO configuration. |
| Lenovo | Yes | In the current running CR, UE release spCellConfig and suspend all RBs during initiating re-establishment only if UE is not configured with conditionalReconfiguration. Similarly, otherconfig(delayBudgetReportingConfig and overheatingAssistanceConfig) is released if UE is not configured with conditionalReconfiguration |
| Panasonic | Neutral | We understand the issue and remedy brought in [6]. However, as *otherconfig* is not as critical as spCellConfig and MCG SCell, we wonder whether such remedy is really necessary. Besides, the misalignment issue could be resolved if the target cell can assume that the UE has released *otherconfig*, upon receiving the RRCReestablishmentRequest. |

# 3 Summary

# 4 Conclusions

# 5 List of referenced documents

[1] R2-2002900 *T304 running issue when CHO Execution,* LG Electronics, 3GPP TSG-RAN WG2 Meeting #109bis-e Elbonia, Online, 20 – 30 April 2020

[2] R2-2002996 *Corrections to conditional configuration evaluation,* Panasonic, 3GPP TSG-RAN WG2 Meeting #109bis-e Elbonia, Online, 20 – 30 April 2020

[3] R2-2003105 *E-mail discussion report [Post109bis-e#12][MOB] Resolving open issues for CHO* Nokia, Nokia Shanghai Bell, 3GPP TSG-RAN WG2 Meeting #109bis-e Elbonia, Online, 20 – 30 April 2020

[4] R2-2003035 *CHO and MR-DC operation*, Ericsson, 3GPP TSG-RAN WG2 Meeting #109bis-e Elbonia, Online, 20 – 30 April 2020

[5] R2-2003333 *Clarification on source reconfiguration during CHO*, Samsung, 3GPP TSG-RAN WG2 Meeting #109bis-e Elbonia, Online, 20 – 30 April 2020

[6] R2-2003609 *UE configuration release in RRC reestablishment*, Sharp, 3GPP TSG-RAN WG2 Meeting #109bis-e Elbonia, Online, 20 – 30 April 2020