**3GPP TSG-RAN WG2 Meeting #126 R2-240xxx**

**Fukuoka, Japan May 20th – 26th, 2024**

Agenda item: 7.4.3.2

Source: OPPO (Rapporteur)

Title: Report of [AT126][504][R18MobE] Conditional Mobility

Document for: Discussion and Agreement

# Introduction

This document captures discussions and proposals from the following offline discussion:

* [AT126][504][R18MobE] Conditional Mobility (OPPO)

 Scope: Cover and Converge on MCG reset to the extent reasonable, at least pave the way for decision at online CB. Can include some remaining part of other untreated tdocs if needed. Progress indicated parts and TP aspects.

 Intended outcome: Report w TP

 Deadline: CB, see schedule

# Discussion

## 2.1 MCG MAC reset

Regarding whether MCG MAC reset can be performed upon SCPAC execution, a RIL [C147] on this was raised as follows:

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| **[RIL]**: C147 **[Delegate]**: CATT (Rui) **[WI]**: Mob **[Class]**:1 **[Status]**: ToDo **[TDoc]**: R2-24xxxxx **[Proposed Conclusion]**: v7**[Description]**: MCG MAC reset should not be performed upon S-CPAC execution. If the MCG MAC is reset upon S-CPAC execution, the network does not know the MAC reset is performed by UE, so it will not perform MAC reset, this may cause the misalign for MAC states between UE side and network side, which may cause the RRCReconfigurationComplete message cannot be received successfully by network**[Proposed Change]**: Remove the “2> reset MCG MAC”**[Comments]**: Huawei: is it possible to apply default MAC cell group configuration but not reset MCG MAC? The MN will only know upon receiving the complete message, but perhaps it can work this way? |

In last meeting, the RIL [C147] was discussed but there was no consensus on whether it is an issue yet.

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| **No consensus for now that there is an issue to resolve, can CB next meeting if needed.**  |

In this meeting, companies further provide their considerations on how to handle the MCG MAC at SCPAC execution as follows:

[R2-2405217](file:///C%3A%5C%5CUsers%5C%5Cmtk65284%5C%5CDocuments%5C%5C3GPP%5C%5Ctsg_ran%5C%5CWG2_RL2%5C%5CRAN2%5C%5CDocs%5C%5CR2-2405217.zip%22%20%5Co%20%22C%3AUsersmtk65284Documents3GPPtsg_ranWG2_RL2RAN2DocsR2-2405217.zip) [C147] MAC behaviours in SCPAC Huawei, HiSilicon discussion Rel-18 NR\_Mob\_enh2-Core

**Proposal 1: Discuss whether:**

**a) MCG MAC is always reset at SCPAC execution (which can cause some short-term failures in MAC)**

**b) MCG MAC is not reset at SCPAC execution and the MN needs to use different LCID values for the MCG RLC bearer serving a radio bearer when the radio bearer is terminated in the MN and in the SN**

[R2-2405386](file:///C%3A%5C%5CUsers%5C%5Cmtk65284%5C%5CDocuments%5C%5C3GPP%5C%5Ctsg_ran%5C%5CWG2_RL2%5C%5CRAN2%5C%5CDocs%5C%5CR2-2405386.zip%22%20%5Co%20%22C%3AUsersmtk65284Documents3GPPtsg_ranWG2_RL2RAN2DocsR2-2405386.zip) [C147] MCG MAC reset upon SCPAC execution CATT discussion NR\_Mob\_enh2-Core

**Proposal 1: To address RIL [C147], MAC reset is not performed at MCG side upon SCPAC execution. TP in Annex 1 is adopted.**

[R2-2405190](file:///C%3A%5C%5CUsers%5C%5Cmtk65284%5C%5CDocuments%5C%5C3GPP%5C%5Ctsg_ran%5C%5CWG2_RL2%5C%5CRAN2%5C%5CDocs%5C%5CR2-2405190.zip%22%20%5Co%20%22C%3AUsersmtk65284Documents3GPPtsg_ranWG2_RL2RAN2DocsR2-2405190.zip) On MCG Reset handling for SCPAC in MN-Format Nokia discussion

**Proposal 1: Introduce additional parameter “Configuration-Format” as common parameter across all candidate configuration that can be used to decide on whether to replace the MCG configuration and associated actions. TP for this proposal is provided in Annexure.**

**Proposal 2: RAN2 to discuss introduction of Group-ID for common-MCG configuration to enable UE to decide on MCG configuration change and MCG reset based on the Group-ID.**

*Conclusion:*

## 2.2 [E220]

During the ASN.1 review period, [E220] is proposed, and this issue is descripted as follow.

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| **[RIL]**: E220 **[Delegate]**: Ericsson (Cecilia) **[WI]**: Mob **[Class]**: 2 **[Status]**: ToDo **[TDoc]**: None **[Proposed Conclusion]**: **[Description]**: It is unclear whether sk-Counter can be sent even if the sk-CounterList is configured. That is necessary as legacy PSCell change can happen also when the UE is configured with subsequent CPAC. **[Proposed Change]**: Check with SA3 whether the use of sk-Counter is supported even if sk-CounterList is configured. **[Comments]**: |

The RIL is discussed in R2-2404605.

[R2-2404605](file:///C%3A%5C%5CUsers%5C%5Cmtk65284%5C%5CDocuments%5C%5C3GPP%5C%5Ctsg_ran%5C%5CWG2_RL2%5C%5CRAN2%5C%5CDocs%5C%5CR2-2404605.zip%22%20%5Co%20%22C%3AUsersmtk65284Documents3GPPtsg_ranWG2_RL2RAN2DocsR2-2404605.zip) [E220] Issue on the presence of sk-counter in SCPAC CATT discussion Rel-18 NR\_Mob\_enh2-Core

**Proposal 1: The sk-Counter can be configured for legacy inter-SN PSCell change/addition if subsequent CPAC configuration is configured or included in the same RRC message. No spec change is needed.**

**Proposal 2: The sk-Counter can be configured legacy CPAC if subsequent CPAC configuration is configured or included in the same RRC message. No spec change is needed.**

**Proposal 3: The sk-Counter is absent in the RRCReconfiguration message contained in condRRCReconfig which is for a SCPAC candidate. TP in Annex 1 is adopted.**

*Conclusion:*

## 2.3 L2 reset handling at SCPAC execution

In last RAN2 meeting, there was a proposal in R2-2402967 to discuss how to perform L2 reset for MN-terminated SCG bearer and the conclusion was made as follows.

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| [R2-2402967](file:///C%3A%5C%5CUsers%5C%5Cmtk65284%5C%5CDocuments%5C%5C3GPP%5C%5Ctsg_ran%5C%5CWG2_RL2%5C%5CRAN2%5C%5CDocs%5C%5CR2-2402967.zip%22%20%5Co%20%22C%3AUsersmtk65284Documents3GPPtsg_ranWG2_RL2RAN2DocsR2-2402967.zip) Discussion on remaining issues of L2 reset for SCPAC NEC discussion Rel-18 NR\_Mob\_enh2-CoreNEC explains that P1 and P2 should be addressed - Nokia think that reestablishment is only for anchor point change. - HW think that for P2, the network can send the reestablish indication directly, no need to have this in the procedure. - OPPO think for P2, indeed the network can indicate, agree with P1. - ZTE think p1 is ok, but think this is covered in the current TS, - Intel think we can just discuss if the explicit flag is sufficient also for P1 .. **P1, determine what change is needed, if any, in post meeting disc.**  |

In this meeting, how to perform L2 reset at SCPAC execution is further discussed in the following paper.

[R2-2404412](file:///C%3A%5C%5CUsers%5C%5Cmtk65284%5C%5CDocuments%5C%5C3GPP%5C%5Ctsg_ran%5C%5CWG2_RL2%5C%5CRAN2%5C%5CDocs%5C%5CR2-2404412.zip%22%20%5Co%20%22C%3AUsersmtk65284Documents3GPPtsg_ranWG2_RL2RAN2DocsR2-2404412.zip) Discussion on L2 reset for SCPAC execution OPPO, NEC discussion Rel-18 NR\_Mob\_enh2-Core

1. In current RRC specification, the UE always performs RLC re-establishment for a radio bearer with termination point change/security key update, even for the case that the RLC entity is to be released.
2. **For a radio bearer with termination point change/security key update, the UE performs RLC re-establishment for the RLC entity if it is configured in both source configuration and target cell configuration.**

**Proposal 2 L2 reset handling for radio bearers without termination point change or security key update include:**

* 1. **Perform RLC re-establishment for SCG RLC entity if it is configured in both source configuration and target cell configuration.**
	2. **Perform PDCP data recovery for AM DRB if the associated RLC entity is released/re-established.**

*Conclusion:*

## 2.4 Issue on the presence of *servingSecurityCellSetID*

After RAN2#125bis meeting, based on post email discussion [Post125bis][510], the condition “*condInitialSCPAC*” of *servingSecurityCellSetId* is changed as follow.

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| *condInitialSCPAC*  | The field is mandatory present at the initial configuration of subsequent CPAC for inter-SN CPC or CPA, generated by the MN, which includes at least one inter-SN candidate PSCell supporting subsequent CPAC. The field is absent for any conditional reconfiguration generated by the SN. Otherwise, the field is optional, need M. |

However, the *servingSecurityCellSetID* should be absent for CPA case where there is no serving PSCell and the issue is discussed in both R2-2404606 and R2-2404425.

[R2-2404606](file:///C%3A%5C%5CUsers%5C%5Cmtk65284%5C%5CDocuments%5C%5C3GPP%5C%5Ctsg_ran%5C%5CWG2_RL2%5C%5CRAN2%5C%5CDocs%5C%5CR2-2404606.zip%22%20%5Co%20%22C%3AUsersmtk65284Documents3GPPtsg_ranWG2_RL2RAN2DocsR2-2404606.zip) Remaining SCPAC issues CATT discussion Rel-18 NR\_Mob\_enh2-Core

**Proposal 3: *servingSecurityCellSetId* is mandatory present at the initial configuration of subsequent CPAC for inter-SN CPC, but should not be present for at the initial configuration of subsequent CPAC for CPA. TP in Annex 3 is adopted.**

[R2-2404415](file:///C%3A%5C%5CUsers%5C%5Cmtk65284%5C%5CDocuments%5C%5C3GPP%5C%5Ctsg_ran%5C%5CWG2_RL2%5C%5CRAN2%5C%5CDocs%5C%5CR2-2404415.zip%22%20%5Co%20%22C%3AUsersmtk65284Documents3GPPtsg_ranWG2_RL2RAN2DocsR2-2404415.zip) Discussion on remaining issues for SCPAC execution OPPO discussion Rel-18 NR\_Mob\_enh2-Core

**Proposal 5 The servingSecurityCellSetId is not present in the initial configuration of SCPAC for CPA.**

**Proposal 6 Add a NOTE to reflect the agreement that rely on NW to guarantee the validity of servingSecurityCellSetID after normal PSCell change, i.e. NW update the sourceSecurityCellSetID if the SecurityCellSetID of target PScell is different.**

NOTE 1: It is up to network to provide a valid *servingSecurityCellSetId* if the *RRCReconfiguration* message including *reconfigurationWithSync* in *spCellConfig* of an SCG is not applied due to the conditional reconfiguration execution for subsequent CPAC.

*Conclusion:*

## 2.5 Pending issues of online

[R2-2404439](file:///C%3A%5C%5CUsers%5C%5Cmtk65284%5C%5CDocuments%5C%5C3GPP%5C%5Ctsg_ran%5C%5CWG2_RL2%5C%5CRAN2%5C%5CDocs%5C%5CR2-2404439.zip%22%20%5Co%20%22C%3AUsersmtk65284Documents3GPPtsg_ranWG2_RL2RAN2DocsR2-2404439.zip) [V138] Discussion on simultaneous evaluation for both condExecutionCond and condExecutionCondSCG vivo, CATT, OPPO, LG Electronics discussion Rel-18 NR\_Mob\_enh2-Core

- Ericsson think the term applicable measID is not defined. Vivo explain that other wordings can be possible.

- Huawei think indeed there is an unclarity.

- Nokia think the NR-DC check is not needed. vivo think this is C147.

* Intention agreeable but TP need updates

**Updated TP: Adopt the updated TP(Annex 4.1) for P1 of R2-2404439.**

*Conclusion:*

[R2-2405060](file:///C%3A%5C%5CUsers%5C%5Cmtk65284%5C%5CDocuments%5C%5C3GPP%5C%5Ctsg_ran%5C%5CWG2_RL2%5C%5CRAN2%5C%5CDocs%5C%5CR2-2405060.zip%22%20%5Co%20%22C%3AUsersmtk65284Documents3GPPtsg_ranWG2_RL2RAN2DocsR2-2405060.zip) [Z062][Z063][Z064] Remaining issues for subsequent CPAC ZTE Corporation discussion Rel-18 NR\_Mob\_enh2-Core

DISCUSSION

- Huawei think both TPs are ok.

- OPPO think no change is needed, think for P1 the legacy text is applicable. ZTE think there is a mismatch between stage-2 and stage-3.

- NEC also agree with intention, think TP for P1 is ok, for P2 need some modification.

- Ericsson agrees with intentions of P1 P2 think TP can be simplified. Think P4 is not needed

- vivo support.

* Direction of P1P2 is agreeable, offline disc TP and whether clarification discussed for P4 is needed/desired.

**Updated P1P2: Adopt the updated TP(Annex4.2) for P1P2 of R2-2405060.**

**Proposal 4: RAN2 clarifies that the candidateCellInfoListSubsequentCPC is only included in the CG-Config message contained in the CG-CandidateList message, to imply the association between the candidate cell and the list of execution conditions for the following execution of subsequent CPAC.**

*Conclusion:*

[R2-2404483](file:///C%3A%5C%5CUsers%5C%5Cmtk65284%5C%5CDocuments%5C%5C3GPP%5C%5Ctsg_ran%5C%5CWG2_RL2%5C%5CRAN2%5C%5CDocs%5C%5CR2-2404483.zip%22%20%5Co%20%22C%3AUsersmtk65284Documents3GPPtsg_ranWG2_RL2RAN2DocsR2-2404483.zip) Open issues for subsequent CPAC Ericsson discussion Rel-18 NR\_Mob\_enh2-Core

DISCUSSION

P4

- OPPO agrees, but think it need to be complemented.

- Nokia think this is already covered

* Check offline whether clarifications related to P4 are needed

**Proposal 4 The check whether the other conditional reconfiguration (with condReconfigId) is a legacy CPC/CPA configuration should be included in the procedure for evaluation of CPA/CPC/CPAC configurations in 5.3.5.13.4.**

**Proposal 6 Send an LS to SA3 to ask** **whether it is acceptable to send a separate sk-counter/security key to the UE and SN when the UE is configured with an sk-CounterList for that SN.**

*Conclusion:*

## 2.6 Other corrections

[R2-2404606](file:///C%3A%5C%5CUsers%5C%5Cmtk65284%5C%5CDocuments%5C%5C3GPP%5C%5Ctsg_ran%5C%5CWG2_RL2%5C%5CRAN2%5C%5CDocs%5C%5CR2-2404606.zip%22%20%5Co%20%22C%3AUsersmtk65284Documents3GPPtsg_ranWG2_RL2RAN2DocsR2-2404606.zip) Remaining SCPAC issues CATT discussion Rel-18 NR\_Mob\_enh2-Core

Issue on SCPAC configuration updating upon normal PSCell change

**Proposal 1: configurations/fields specific to SCPAC can be configured to UE upon normal PSCell change or normal PCell change. SCPAC configuration nested in legacy CPAC configuration or CHO configuration is not allowed. TP in Annex 1 is adopted.**

Issue on the configuration of *securityCellSetId*

**Proposal 2: For subsequent CPAC for CPA (i.e., *servingSecurityCellSetId* is absent), if at least one of the candidate configuration of subsequent CPAC is configured with *securityCellSetId*, *securityCellSetId* are configured for all the candidate configuration of subsequent CPAC. TP in Annex 2 is adopted.**

*Conclusion:*

[R2-2404415](file:///C%3A%5C%5CUsers%5C%5Cmtk65284%5C%5CDocuments%5C%5C3GPP%5C%5Ctsg_ran%5C%5CWG2_RL2%5C%5CRAN2%5C%5CDocs%5C%5CR2-2404415.zip%22%20%5Co%20%22C%3AUsersmtk65284Documents3GPPtsg_ranWG2_RL2RAN2DocsR2-2404415.zip) Discussion on remaining issues for SCPAC execution OPPO discussion Rel-18 NR\_Mob\_enh2-Core

Issue on handling of RLC entities at the start of SCPAC execution

**Proposal 1 For each SRB/DRB in current UE configuration, the UE keeps the associated RLC entities, their state variables, buffers and timers at the start of SCPAC execution.**

Issue on release of invalid configuration

**Proposal 2 The UE releases the configurations that were part of the UE configuration before of this subsequent CPAC execution procedure but not part of the selected subsequent CPAC candidate configuration/ subsequent CPAC reference configuration.**

**Proposal 3 The RLC bearer(s) are released if they were part of the UE configuration before of this subsequent CPAC execution procedure but not part of the selected subsequent CPAC candidate configuration/ subsequent CPAC reference configuration.**

Issue on presence of *discardOnPDCP* and *reestablishRLC*

**Proposal 4 Remove the restriction that the NW can not include discardOnPDCP and reestablishRLC for SRB3 in case of SCPAC in SN format.**

*Conclusion:*

**??Way forward: P1P2 in R2-2404606 and P1-P4 in [R2-2404415](file:///C%3A%5C%5CUsers%5C%5Cmtk65284%5C%5CDocuments%5C%5C3GPP%5C%5Ctsg_ran%5C%5CWG2_RL2%5C%5CRAN2%5C%5CDocs%5C%5CR2-2404415.zip%22%20%5Co%20%22C%3AUsersmtk65284Documents3GPPtsg_ranWG2_RL2RAN2DocsR2-2404415.zip) are discussed during post email discussion for RRC CR implementation.**

# 3 Conclusion

Based on the offline discussion, we hereby propose that:

# 4 Annex

### 4.1 Updated TP for[V138]

### 4.2 Updated TP for [Z062][Z063]

| ***CondReconfigToAddMod* field descriptions** |
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| ***condExecutionCond***The execution condition that needs to be fulfilled in order to trigger the execution of a conditional reconfiguration for CHO, CPA, intra-SN CPC without MN involvement, MN initiated inter-SN CPC, MN initiated subsequent CPAC or SN initiated intra-SN subsequent CPAC without MN involvement. When configuring 2 triggering events (Meas Ids) for a candidate cell, the network ensures that both refer to the same *measObject.* The network configures at most one from *condEventD1, condEventD2* or *condEventT1* for the same candidate cell. For CPA and for MN-initiated inter-SN CPC and for MN initiated subsequent CPAC, the network only indicates *MeasId*(s) associated with *condEventA4*. For intra-SN CPC and for SN initiated intra-SN subsequent CPAC without MN involvement, the network only indicates *MeasId*(s) associated with *condEventA3* or *condEventA5*. |
| ***condExecutionCondSCG***Contains execution condition that needs to be fulfilled in order to trigger the execution of a conditional reconfiguration for SN initiated inter-SN CPC, SN initiated inter-SN subsequent CPAC, or SN initiated intra-SN subsequent CPAC with MN involvement. The Meas Ids refer to the *measConfig* associated with the SCG. When configuring 2 triggering events (Meas Ids) for a candidate cell, network ensures that both refer to the same *measObject*. For each *condReconfigId*, the network always configures either *condExecutionCond* or *condExecutionCondSCG* (not both). The network only indicates *MeasId*(s) associated with *condEventA3* or *condEventA5*. |

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| ***CondExecutionCondToAddMod* field descriptions** |
| ***subsequentCondExecutionCond***The execution condition that needs to be fulfilled in order to trigger the following execution of a conditional reconfiguration for SN initiated intra-SN subsequent CPAC without MN involvement. When configuring 2 triggering events (Meas Ids) for a candidate cell, the network ensures that both refer to the same *measObject*. The network only indicates *MeasId*(s) associated with *condEventA3* or *condEventA5*. |
| ***subsequentCondExecutionCondSCG***Contains execution condition that needs to be fulfilled in order to trigger the following execution of a conditional reconfiguration for SN initiated inter-SN subsequent CPAC, SN initiated intra-SN subsequent CPAC with MN involvement, or MN initiated inter-SN subsequent CPAC. The Meas Ids refer to the *measConfig* associated with the SCG. When configuring 2 triggering events (Meas Ids) for a candidate cell, network ensures that both refer to the same *measObject*. The network only indicates *MeasId*(s) associated with *condEventA3* or *condEventA5*. |