**3GPP TSG-RAN WG2 Meeting #116 electronic R2-21xxxxx**

**Online, 1 – 12 Nov 2021**

**Agenda Item: 6.1.4.1.1 Connection control**

**Source: Huawei**

**Title: Report of [AT116-e][008][NR16] Connection Control I (Huawei)**

**Document for: Discussion and decision**

# Introduction

This document is to kick off the following email discussion:

* [AT116-e][008][NR16] Connection Control I (Huawei)

Scope: Determine agreeable parts in a first phase, for agreeable parts agree on CRs. Treat [R2-2110879](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_116-e\Docs\R2-2110879.zip), [R2-2109314](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_116-e\Docs\R2-2109314.zip), [R2-2110626](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_116-e\Docs\R2-2110626.zip), [R2-2109864](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_116-e\Docs\R2-2109864.zip), [R2-2110421](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_116-e\Docs\R2-2110421.zip), [R2-2110423](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_116-e\Docs\R2-2110423.zip), [R2-2111173](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_116-e\Docs\R2-2111173.zip), [R2-2110631](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_116-e\Docs\R2-2110631.zip), [R2-2110632](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_116-e\Docs\R2-2110632.zip), [R2-2111080](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_116-e\Docs\R2-2111080.zip), [R2-2111070](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_116-e\Docs\R2-2111070.zip), [R2-2111071](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_116-e\Docs\R2-2111071.zip)

Intended outcome: Report, Agreed CRs if applicable

Deadline: Schedule 1

Discussions with Deadline **Schedule 1**:

A **first round** with **Deadline for comments Thursday W1 Nov 4 1200 UTC** to settle scope what is agreeable etc

A Final round with **Final deadline Thursday W2 Nov 11 1200 UTC** to settle details / agree CRs etc.

**Contact Information**

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# Discussion

Companies could add comments for contributions below.

## L1 eMIMO

[1] [R2-2110879](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_116-e\Docs\R2-2110879.zip) Correction on pucch-SpatialRelationInfoId-v1610 Huawei, HiSilicon CR Rel-16 38.331 16.6.0 2858 - F NR\_eMIMO-Core

In [1], the issues of the presence condition of pucch-SpatialRelationInfoId-v1610 is discussed, and it is proposed to replace the presence condition by Need S (as in the example in A.4.3.6).

**Q1: Do companies agree the changes of the CR [1]?**

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| Company | Agree?  (Yes or No) | Comments |
| Ericsson | Yes | This Cond Setup does not make any sense in this context, and has likely been left from some early draft ASN.1. |
| MediaTek | Yes |  |
| Nokia | OK for problem NOK for solution | The issue is real but the solution makes it worse by introducing more ambiguities.  First, indeed the condition is wrong and should say "the field is \*optional\* upon creation…" instead of mandatory. That alone would help a lot. However, the point was that this is ONLY used for the size extension cases, NOT for the original spatial relations. That's why it was mandatory.  Second, Need S without conditions on absence just makes the field badly defined - was the intent that this would be Need R in that case?  Third, while this is NBC CR, it's unlikely anyone has implemented it yet so that's not the main problem.  Fourth, saying "it's not possible to modify the ID" is true but misses the point: These are used via AddModRelease-lists. Hence, it's always possible to release and add the spatial relation in the same message and provide a new ID. Therefore, there's no real need to have a release mechanism for the extended ID as there are other ways to change it (as always, we should NOT create multiple parallel ways for this). Also note that this is the "size-extended" list, not the original list. But we do get the point that maybe network would want to modify PUCCH spatial relation at some point, so no strong view.  Hence we think at minimum, we should fix the following: 1) Need M --> Need R in the condition. The rest is not required. |
| Samsung | Yes |  |
| Huawei, HiSilicon | Yes  (Proponent) |  |
| ZTE | Yes for the intention | Agree with the intention. But the change is NBC, if the majority thinks the CR is agreeable, we can also accept it. |
| Apple | Yes |  |
| QCOM | Yes | The change is needed |
| OPPO | Yes |  |
| Xiaomi | Yes |  |
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Summary: TBD

## L1 NR-U

[2] [R2-2109314](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_116-e\Docs\R2-2109314.zip) LS to RAN2 on default value for rb-Offset (R1-2108436; contact: Ericsson) RAN1 LS in Rel-16 NR\_unlic-Core To:RAN2

[3] [R2-2110626](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_116-e\Docs\R2-2110626.zip) Clarification of default value for rb-Offset Nokia, Nokia Shanghai Bell CR Rel-16 38.331 16.6.0 2840 - F NR\_unlic

[4] R2-2109864 Correction of default value of rb-offset Ericsson CR Rel-16 38.331 16.6.0 2819 - F NR\_unlic-Core

In [2], RAN1 discussed the issue of rb-Offset and has the following conclusions:

RAN1 has discussed both RAN1 and RAN2-centric solutions, and has agreed that it would be more straightforward for RAN2 to make a change to 38.331 to resolve the incompatibility. The RAN2-centric solution that RAN1 discussed is the following; however, RAN1 acknowledges that the final decision is up to RAN2.

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| ***rb-Offset***  Indicates the RB level offset in units of RB from the first RB of the first 6RB group to the first RB of BWP (see 38.213 [13], clause 10.1). ~~When the field is absent, the UE applies the value 0.~~ |

And then the action to RAN2 is as below:

**To TSG RAN WG2**

**ACTION:** RAN1 respectfully requests RAN2 to implement a suitable correction to 38.331 to remove incompatibility between RAN1 and RAN2 specs with respect to the Rel-16 parameter *rb-Offset*.

The CR [3] is related to the incoming LS [2] and the proposed changes are as below:

***rb-Offset***

Indicates the RB level offset in units of RB from the first RB of the first 6RB group to the first RB of BWP (see 38.213 [13], clause 10.1). When the field is absent, the UE applies the value specified in 38.213 [13], clause 10.1.

The CR [4] is related to the incoming LS [2] and the proposed changes are as below:

rb-Offset-r16 INTEGER (0..5) OPTIONAL,

***rb-Offset***

Indicates the RB level offset in units of RB from the first RB of the first 6RB group to the first RB of BWP (see 38.213 [13], clause 10.1).

In general, three types of changes are provided ([2][3][4]), so it is proposed to collect companies’ opinions on these changes.

**Q2: In order to solve the issue mentioned in the LS [2], which of changes do companies prefer?**

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| --- | --- | --- |
| Company | [2], or [3], or [4], or others? | Comments |
| Ericsson | [4] | [4] simply proposes to remove the second sentence and the Need -S as the first sentence already refers to 38.213, clause 10.1.  The proposed change in [3] is not accurate as 38.213 does not always assign a value, see the following example: “the first common RB of the first group of 6 PRBs has common RB index if *rb-Offset-r16* is not provided“  Thus, no value is set there for rb-Offset. |
| MediaTek | [4] |  |
| Nokia | [4] | Okay we get the point that if Need S is removed then things should work but removing the Need S will make this NBC? |
| Samsung | [4] |  |
| Huawei, HiSilicon | [3], [4] | We prefer first [3] as not to change ASN.1 however if what Ericsson stated about 38.213 configuration flaw can be confirmed then [4]. |
| ZTE | [4] |  |
| Apple | [4] |  |
| QCOM | [4] |  |
| OPPO | [4] |  |
| Sharp | [4] |  |
| Xiaomi | [4] |  |
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Summary: TBD

## Conditional Reconfiguration

[5] [R2-2110421](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_116-e\Docs\R2-2110421.zip) CPC handling during recovery procedure Lenovo, Motorola Mobility CR Rel-16 38.331 16.6.0 2828 - F NR\_Mob\_enh-Core

[6] [R2-2110423](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_116-e\Docs\R2-2110423.zip) CPC handling during recovery procedure Lenovo, Motorola Mobility CR Rel-16 36.331 16.6.0 4731 - F LTE\_feMob-Core

In [5][6], it mentions whether to stop conditional reconfiguration evaluation for CPC when UE initiates re-establishment procedure is not specified, so it is proposed that in the procedure for initiation of RRC connection re-establishment in 5.3.7.2, the UE shall stop conditional reconfiguration evaluation for CPC.

**Q3: Do companies agree the changes of the CRs [5][6]?**

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| --- | --- | --- |
| Company | Agree?  (Yes or No) | Comments |
| Ericsson | Agree with modification | We agree that the specification currently does not correctly capture the UE behaviour as the UE should stop monitor the conditions when the re-establishment is triggered. However, we think the proposal we had to RAN2#115 in R2-2108102 is better as it proposes the same behaviour for CPC and CHO when handover is not attempted. There is also no reason for the UE to keep the whole configuration during the cell reselection procedure. |
| MediaTek | (Neutral) | If the change is needed, we think that both CHO and CPC cases should be considered, as mentioned by Ericsson. However, we concluded in R2#115-e that R2-2108102 was not pursued, implying that this can be handled by proper UE implementation. |
| Nokia | (Neutral) | No strong view, the behavior proposed is correct. On the other hand, we think the UE will try to send SCG Failure Information beforehand and will stop CPC monitoring before sending this message. So in most cases this CPC monitoring may be stopped already before reestablishment is attempted. |
| Samsung | See comments | As MediTek indicated, RAN2 made a decision not to pursue former Ericsson's paper. But, we are ok with the modifications and think CHO case also needs to be considered. |
| Huawei, HiSilicon | (Neutral) | Share similar views as Ericsson. |
| ZTE | (Neutral) | No strong view. If the majority wants this, we are also fine with the change and think both CHO and CPC cases should be considered. |
| Apple | Neutral | Same view as MediaTek. We think it can be handled by proper UE implementation. |
| QCOM | Neutral | It seems Ericsson’s CR is more adequate … I don’t see why not RAN2#116 can revive the CR (if there is consensus). |
| OPPO | Neutral | Same view as MediaTek. We think it can be handled by proper UE implementation. |
| Sharp | No strong view | As commented by Ericsson, the issue is similar to that in R2-2108102. As it has already agreed to not pursue the issue in R2-2108102, we slightly prefer not to have such changes. |
| Xiaomi | (Neutral) | Agree with MTK. Both CHO and CPC cases should be considered.  We think RAN2 can discuss whether it has been solved by UE implementation. When UE initiates re-establishment, it is useless for UE to perform conditional reconfiguration evaluation for CPC or CHO. Maybe in most case CPC and CHO evaluations have been stopped before RRC-reestablishment by UE implementation. |
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Summary: TBD

[7] [R2-2111173](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_116-e\Docs\R2-2111173.zip) Conditional Handover with Two Triggering Events MediaTek Inc. CR Rel-16 38.306 16.6.0 0663 - F NR\_Mob\_enh-Core

In [7], it mentions that some UEs may not be able to support evaluation of two measIds and CHO execution when both events are satisifed, so it is proposed to change the “manadatory supported” to “optionally supported” for *condHandoverTwoTriggerEvents-r16*.

The following CR is moved from email [AT116-e][205] because the CR has similar changes as [7].

[7a] [R2-2111178](http://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_116-e/Docs/R2-2111178.zip) Conditional Handover with Two Trigger Events MediaTek Inc. CR Rel-16 36.306 16.6.0 1832 - F LTE\_feMob-Core

**Q4: Do companies agree the changes of the CR [7][7a]?**

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| Company | Agree?  (Yes or No) | Comments |
| Ericsson | No | We prefer the existing text. |
| MediaTek | Yes | Current text basically invalidates this capability indication. However, requiring two conditions to be both satisfied for CHO execution may not be a good idea in many situations, and we do think that UE should be allowed to support only one triggering event. |
| Nokia | Yes | Agree to have this converted to optional. |
| Samsung | No | Considering the network's logic to command HO discussed in earlier stage of CHO discussion, it is enough to handle only UEs having these mandatory capability. |
| Huawei, HiSilicon | No | The support of *cho-TwoTriggerEvents-r16* (and also *condPSCellChangeTwoTriggerEvents-r16*) was agreed in Rel-16. RAN2 captured both features in TS 38.822 v16.1.0. In the past, RAN2 discussed the use case and benefits of the features, and then both features are conditionally mandatory. We suggest to keep the current definition (for both LTE and NR). |
| ZTE | No | We have discussed this and made the agreement that “For CHO, introduce additional IOT bit (i.e. mandatory with capability) on the support of 2 trigger events for same execution condition. This feature is mandatory for UEs supporting CHO (as per definition of IOT bits).” at RAN2#110e meeting. |
| Apple | Yes |  |
| QCOM | No | Agree with comments above. We note that there are IoT bits for this feature in both LTE and NR, so we do not see a need to modify the description, for both LTE and NR. |
| OPPO | Yes |  |
| Sharp | No | Current text is fine. |
| Xiaomi | Yes | If it is “optionally supported”, some UEs only supporting one triggering event can also support *condHandover-r16*. It is beneficial for these UEs to improve their handover performance. |
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Summary: TBD

[8] [R2-2110631](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_116-e\Docs\R2-2110631.zip) Correction on condRRCReconfig field description Huawei, HiSilicon CR Rel-16 38.331 16.6.0 2842 - F NR\_Mob\_enh-Core

[9] [R2-2110632](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_116-e\Docs\R2-2110632.zip) Correction on condReconfigurationToApply field description Huawei, HiSilicon CR Rel-16 36.331 16.6.0 4736 - F LTE\_feMob-Core

In [8][9], it mentions that the *condRRCReconfig* field can be used for CHO or CPC, and if the field is applied for CPC, it means condRRCReconfiguration can contain the configuration for target SCG, which conflicts with the definition of the *condRRCReconfig* field. So it is proposed to clarify the field description of condRRCReconfig that “the configuration for target SCG” is only for CHO.

**Q5: Do companies agree the changes of the CRs [8][9]?**

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| --- | --- | --- |
| Company | Agree?  (Yes or No) | Comments |
| Ericsson | Maybe | The update is a bit unclear. Perhaps better to say “except if configured for CPC”. |
| MediaTek | Yes |  |
| Nokia | Yes | The same IEs are used for CHO and CPC, so it may be clarified this is only for CHO. Some rewording can be considered (current change is a bit chaotic but some rewording is good). |
| Samsung | Yes | We can simply say "for CHO" rather than "(only for CHO)". |
| Huawei, HiSilicon | Yes | We are ok with Samsung’s suggestion:  or the configuration for target SCG for CHO. |
| ZTE | Yes |  |
| Apple | Yes |  |
| QCOM | Agree with intention | May be better wording as the current proposed change is a bit confusing. E.g.  ***condRRCReconfig***  The *RRCReconfiguration* message to be applied when the condition(s) are fulfilled. The *RRCReconfiguration* message contained in *condRRCReconfig* cannot contain the field *conditionalReconfiguration,* the field *daps-Config* and in case of CHO, it cannot contain the configuration for target SCG. |
| OPPO | Yes |  |
| Sharp | Yes | Prefer wording suggested by Ericsson. |
| Xiaomi | Yes | "for CHO" may be better. Agree with Samsung |
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Summary: TBD

[10] [R2-2111080](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_116-e\Docs\R2-2111080.zip) Conditional reconfiguration issues for modification of measId Xiaomi Communications discussion

Moved from 6.1.4.1.2

In [10], it mentions that currently a reconfigured *measId* lead to a reset of the fulfillment state to non-fulfilled, so UE need at least a TTT to consider the reconfigured event as fulfilled based on the spec, which increases the time for CHO trigger and UE cannot be handed over faster to target cell. It may conflict with NW's purpose of modifying *measId* or associated *reportConfig* when the NW’s reconfiguration is for faster handover. Proposal 1 is suggested to solve the problem

**Proposal 1: When receiving conditional reconfiguration signaling from network to modify a measId or associated *reportConfig* associated with the *condReconfigurationId*, UE shall compare the modified event and the previous event to determine whether UE need to reset the fulfillment state to non-fulfilled, including comparing event conditions, triggering quantity, time to trigger, and triggering threshold.**

**Q6: Do companies agree with proposal 1 in [10]?**

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| Company | Agree?  (Yes or No) | Comments |
| Ericsson | No | Disagree. The current solution, where the UE resets the state is so much simpler, this does not make sense. In addition, these changes should not happen very often, so not worth optimizing. |
| MediaTek | No |  |
| Nokia | No | We don’t see the value of this corner case optimization and think this complicates things more than what is really necessary. |
| Samsung | No |  |
| Huawei, HiSilicon | No | P1 is more like an optimization, and it puts extra complexity to UE side and the value is not so clear. |
| ZTE | No |  |
| Apple | No |  |
| OPPO | No |  |
| Sharp | No |  |
| Xiaomi | Yes | When network find that UE has not triggered CHO and the RSRP/RSRQ of serving cell UE measured has become lower, NW may modify the configuration of CHO and make the associated CHO execution condition easy to be fulfilled for faster handover.  In the case, when NW configured two trigger events for the CHO execution condition, one of previous event may has been fulfilled and NW don’t know because measurement report will not be triggered when CHO conditions fulfilled. So, NW probably modifies the event which has been fulfilled, which need extra time for UE to consider it as fulfilled again and increase the time for CHO trigger. It conflict with NW's purpose. |
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Summary: TBD

[11] [R2-2111070](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_116-e\Docs\R2-2111070.zip) Modification of reportConfig for conditional reconfiguration Xiaomi Communications CR Rel-16 38.331 16.6.0 2860 - F NR\_Mob\_enh-Core

Moved from 6.1.4.1.2

[12] [R2-2111071](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_116-e\Docs\R2-2111071.zip) Modification of reportConfig for conditional reconfiguration Xiaomi Communications CR Rel-16 36.331 16.6.0 4743 - F LTE\_feMob-Core

In [11][12], it mentions that when the associated reportConfig of the measId for conditional reconfiguration is modified, the fulfillment state of the event associated to that reportConfig should also be reset to non-fulfilled. This is similar to modification of measId. So it is proposed that in the procedure for reportConfig modification, the fulfilment of a condition for a measId associated with this reportConfig is reset when the reportConfig is reconfigured.

**Q7: Do companies agree the changes of the CRs [11][12]?**

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| Company | Agree?  (Yes or No) | Comments |
| Ericsson | Yes | In addition, we should also have something for the measObject. Final text could be:  3> if the *measId* or the associated *reportConfig or the associated measObject* for this event associated with the *condReconfigId* has been modified; or  3> if the leaving condition(s) applicable for this event associated with the *condReconfigId*, i.e. the event corresponding with the *condEventId(s)* of the corresponding *condTriggerConfig* within *VarConditionalReconfig*, is fulfilled for the applicable cells for all measurements after layer 3 filtering taken during the corresponding *timeToTrigger* defined for this event within the *VarConditionalReconfig*:  4> consider the event associated to that *measId* to be not fulfilled; |
| MediaTek | Yes | Agree with Ericsson |
| Nokia | No | Does not seem to be essential and correct. The change to measID (which is directly associated with CHO execution condition) should lead to the change of status to non-fulfilled (the evaluation may start from scratch), but why the change to reportConfig shall lead to the same? reportConfig comes into play only after CHO execution condition is met.  So we see no big justification and would propose not to agree the CR. |
| Samsung | Yes | Ericsson's suggestion looks fine for us. |
| Huawei, HiSilicon | No | We understand that reportConfig mentioned in both CRs is about configuration parameters for condEventA3 and condEventA5, e.g. a3-offset, hysteresis, timeToTrigger. It is our understanding that the update of these parameters once configured is infrequent, so there is no need to clarify UE behaviours. For Ericsson’s change, we wonder the motivation of adding “or the associated measObject”. |
| ZTE | No | In our understanding, if the associated reportConfig is changed, e.g. TTT, threshold, offset value is changed, the UE can continue to evaluate whether the triggering/leaving condition is still met based on the updated parameters value. It seems that no strong need to restrict that the event is not fulfilled anymore. |
| Apple | No |  |
| OPPO | Yes | Ok for the original CR. For the part added by Ericsson, we don’t see the need because for a certain candidate cell for which serving frequency is fixed, there is no use case for network to change the measurement object. |
| Sharp | Yes |  |
| Xiaomi | Yes | We are fine with Ericsson’s views.  3> if the *measId* or the associated *reportConfig or the associated measObject* for this event associated with the *condReconfigId* has been modified; or  The configuration of CHO execution condition is included in reportConfig IE. It is also directly associated with CHO execution condition, just like measID modification.  ReportConfigNR ::= SEQUENCE {  reportType CHOICE {  periodical PeriodicalReportConfig,  eventTriggered EventTriggerConfig,  ...,  reportCGI ReportCGI,  reportSFTD ReportSFTD-NR,  condTriggerConfig-r16 CondTriggerConfig-r16,  cli-Periodical-r16 CLI-PeriodicalReportConfig-r16,  cli-EventTriggered-r16 CLI-EventTriggerConfig-r16  }  }  There are three ways to modify CHO execution condition, including modification of measId, modification of reportConfig and modification of measObject. A reconfigured measId for conditional reconfiguration lead to a reset of the fulfillment state to non-fulfilled in CHO, which has been agreed in RAN2#115e. And relevant UE behaviours has been clarified in spec. So, the fulfillment state of CHO event should also be reset to non-fulfilled when associated reportConfig or measObject has been modified, and it is necessary to clarify UE behaviours. |
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Summary: TBD

# Conclusions

[To be added]