3GPP TSG-RAN WG2 #115 electronic R2-210xxxx

Electronic Meeting, Aug 16th – 27th, 2021

Agenda Item: 5.4.3

Source: Ericsson

Title: Summary of offline 015 Rel-15 UE caps I

Document for: Discussion, Decision

# 1 Introduction

This contribution summarizes the following discussion:

* [AT115-e][015][NR15] UE Capabilties I (Ericsson)

Scope: Determine agreeable parts in a first phase, for agreeable parts agree on CRs. Treat R2-2108379, R2-2108380, R2-2108381, R2-2108382, R2-2108581, R2-2108582, R2-2108583, R2-2108584, R2-2108576, R2-2108577, R2-2106909, R2-2107977, R2-2107978,

Intended outcome: Report, agreed CRs if applicable

Deadline: Schedule 1

Companies are invited to fill in contact details.

|  |  |
| --- | --- |
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# 2 Discussion

## 2.1 Part 1: Intended to determine agreeable parts

The CRs in [1][2][3][4] intend to clarify the fallback band combination definition to avoid misleading interpretations e.g. “The current wording suggests that the network should first configure a parent band combination and then deconfigure an SCell/UL SCell/SCG to end up with a fallback band combination” as stated in the coversheet.

**Q1 Do companies agree with the intention of the CRs above?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| Huawei, HiSilicon | No | We think the current text is OK except the SUL correction part, and the proposed changes are not necessary. |
| Qualcomm Incorporated | Yes |  |
| Ericsson | Yes (proponent) | Update: Personally, I can also read the current spec in the intended way, but that is because I have been involved in many discussions about fallbacks over the years. I assume the responders to this email discussion also are experts of what fallbacks are and hence all people replying to this question very well understand that one does not have to configure a parent and then release a carrier to end up at a fallback. We all know this.  But during discussions, especially with RAN4 people, who have not been as deeply involved in all the fallback discussions, it has become clear that the current wording is causing misunderstandings.  During the FR2 fallback discussions which took more than one year, there were still comments from some delegates suggesting that a fallback is only a fallback if we deconfigure some carriers.  So, we acknowledge that the spec is not broken if one reads the spec in the "correct way", but it causes misunderstandings which impairs the progress of 3GPP. Another possibility would be to have a NOTE which clarifies the intention of the "releasing"-language. |
| MediaTek | No | We think current definition is clear. We don’t see how this could be interpreted as „NW has to configured parent first and release to get child“. |
| Nokia | No | The latter part of the proposal is actually a consequence of the part. If just a SCell is dropped there should be nothing required to be modified to the remaining configuration. Usually the current principle seems robust and no other clarifications are required.  Just also checking if there is a UE in the field that misbehaved as there are CRs on this topic? |
| OPPO | No |  |
| ZTE | No | We share the similar view as MTK |
| vivo | No | We share the view from MediaTek and Nokia. |
| CATT | No |  |
| Intel | Yes | But also share the view of others that it may be not that essential. |
| Apple | No | It has been more than one release with this definition and we hope any ambiguity would have be resolved, it’s too late to make corrections/edits in our opinion. |
| Samsung | Yes | It may not be essential, but useful to exclude ambiguity. |

The CRs in [5][6][7][8] intend to clarify that the UE should also support the band combination resulting from the release of SUL configuration, i.e. “the logic of fallback by releasing SCell or SCell uplink should also be applied to SUL case” as stated in the coverseet.

**Q2 Do companies agree with the intention of the CRs above?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| Huawei, HiSilicon | Yes | Proponent |
| Qualcomm Incorporated | Yes | Should be merged with [1]-[4] |
| Ericsson |  | We agree that once releasing SUL the UE shall also support its remaining configuration, but we do not think this needs to be clarified in the specifications. We think in general by e.g. releasing a certaing the UE should support its remaining configuration anyway. |
| MediaTek | Yes |  |
| Nokia | Yes | We see a point to clarify SUL here as the modelling was different here. |
| OPPO | Yes |  |
| ZTE | FFS(We are not sure whether there is a NBC issue) | We are not sure whether the CR is align with all of the UE vendors’ current implementation and whether the related fallback has been well tested. So the confirmation from all of the UE vendors are needed. |
| vivo | No strong view | Not sure if the SUL case can already be covered by the description of “uplink configuration” in the front. If the majority thinks it cannot or a clearer description is needed, we are fine to follow the majority’s view. |
| CATT | Yes | seems useful to clarify. |
| Intel | Yes |  |
| Apple | Same view as Vivo. |  |
| Samsung | Yes |  |

The CRs in [9][10] intend to clarify how the *CarrierAggregationVariant* capability is applicable to the fallback definition when configuring single CC or single mode CA, e.g. “if for a BC (FDD + TDD CA) *CarrierAggregationVariant* indicates pCell can only be placed on FDD cell, whether a TDD only single Cell/CA is considered as “Fallback band combination’ of the combination?” as stated in the coverseet. The CRs propose to clarify that *CarrierAggregationVariant* is applicable to any fallback band combination, including the case when configuring single CC or single mode CA.

**Q3 Do companies agree with the intention of the CRs above?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| Huawei, HiSilicon | Yes | Proponent |
| Qualcomm Incorporated | No | Agree with the intention, but it is clear in [1]-[4] that the fallback is about not changing PCell. |
| Ericsson | No | We think *CarrierAggregationVariant* is only applicable to CA case as it is stated in the current field descriptions, so it should not be applicable to single CC case. |
| MediaTek | No strong view | We also understand that CarrierAggregationVariant capability is still applicable after fallback. But no sure this need to be clarified. |
| Nokia | No | Yes, this is similar discussion as the BCS of parent BC. Why we would want to capture each case similarly why not a general definition which specifically says fallback BC inherits the same properties as the parent. If not the UE signals the BC once again with different properties?  So this should be normal case rather than capturing each and every case. |
| OPPO | No | We also share the view that it is not for single-CC case.  And for CA case, same view as MTK above. |
| ZTE | No | We don’t think the CR is necessary, for that the notes also comply with the existing principle.If some clarification needed, including it in the chairman notes. |
| vivo | Yes | We share the view in the summary of change. The CRs are acceptable from our perspective. |
| CATT | maybe yes | Firstly we observe from the discussion so far that it would be useful to clarify the common understanding on applicalibity of *CarrierAggregationVariant for the fallback case.*  Then we are open to discuss on exact way of clarification. Let’s first align the understanding of the intended behaivor. |
| Intel | No | It is clear from the current text that the releasing is on the SCell or uplink of SCell or SCG. Hence we are not sure it is necessary to include the note. In general, there are multiple UE capabilities limiting a same feature (e.g. channel bandwidth) and it is expected that gNB should take into accounts multiple UE capabilities to derive actual UE capability. That is, gNB should take into accounts this band combination and *CarrierAggregationVariant*to configure the actual configuration that UE can support. |
| Apple | No | We think the current description is clear and PCell would not be changed as part of fallback. |
| Samsung | No | The current specification seems clear enough |

The CRs in [12][13] are related to the LS received from RAN1 [11] where it is confirmed that *multiDCI-MultiTRP* is applicable to the fallback definition. Hence, the CRs propose to correct the fallback definition for feature set per CC in a generic manner, which accounts for the *multiDCI-MultiTRP* capability (introduced in Rel-16) and *ModulationOrder* (introduced in Rel-15 and confirmed to be part of fallback definition in a previous LS R2-1810975).

**Q4 Do companies agree with the intention of the CRs above?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| Huawei, HiSilicon | Yes |  |
| Qualcomm Incorporated | Yes |  |
| Ericsson | Yes (proponent) |  |
| MediaTek | Yes |  |
| Nokia | Yes | Suggested rewording: I would suggest to reword not to delete the text as it has some good context already.  How would this sound?  Fallback per CC feature set: A feature set per CC that has same or lower capabilities than the capabilities of UE (e.g. supported MIMO layers, BW) while keeping the numerology and other parameters the same for the reported feature set per CC for a given carrier per band. |
| OPPO | Yes |  |
| ZTE | Yes (proponent) |  |
| vivo | Yes | It seems not desirable to check which capabilities are subject to the fallback definition and whch are not one by one. In this sense, a generic description looks better. |
| CATT | Yes |  |
| Intel | No | We prefer to explicitly list the capabilities that are applicable to the fallback definition. Also our understanding is that the supportedModulationOrder is not part of the fallback definition since it is only used for data rate calculation i.e. actual support for modulation order is indicated based on pdsch-256QAM-FR1/ pdsch-256QAM-FR2/pusch-256QAM.  However we have no strong view and can follow the majority view to make it generic. |
| Apple | No | Aligned with Intel, we cannot generalize fallback parameters. The current agreed ones are the ones where fallback is implied. In addition, adding a general statement is very risky. |
| Samsung | Yes | It seems editorial to update to further general sentence in order to exclude ambiguity. |

### 2.1.1 Summary of Part 1

According to the feedback for Q1, most of the companies are not in favor of any change, while among the fewer companies that expressed support, many also mentioned that the change is not essential. Hence, it is proposed to not pursue this change and not agree on the corresponding CRs.

1. The CRs R2-2108379, R2-2108380, R2-2108381 and R2-2108382 are not pursued.

On Q2, most of the companies agree with the intention of the CR. One company did not see a need for the clarification; while some companies also mentioned that SUL case could already be covered by the description of “uplink configuration”, but also stated that would be fine to follow majority if a clarification is deemed necessary; one company mentioned this topic should be FFS due to the concern that the change may be NBC. However, companies seem to be fine with the change and the support of the band combination resulting from the release of SUL configuration was not challenged. Therefore, it is suggested to pursue with the CRs.

1. The CRs R2-2108581, R2-2108582, R2-2108583 and R2-2108584 are pursued, further comments (if any) can be addressed in phase 2.

From the feedback to Q3, most of the companies do not see a need to pursue this change since it should be clear already that e.g. when releasing an SCell the UE should also support the remaining configuration, which include the PCell configured according to the UE supported *CarrierAggregationVariant*. Among the companies in favor of the change, one of them stated that the CRs are acceptable, while another company pointed out that we should first align the understanding of the IE *CarrierAggregationVariant*. But since many comments also pointed out in the direction that the current IE is actually clear (which is also confirmed by the field *spCellPlacement* wich instantiates this IE in 38.306, see below) we suggest to not pursue the CRs.

***spCellPlacement***

Indicates whether the UE supports a SpCell on FR1-FDD, FR1-TDD and/or FR2-TDD depending on which additional SCells of other frequency range(s) / duplex mode(s) are configured. It is applicable to NR SA and NR-DC (both MCG and SCG), where UL is configured on more than one of FR1-FDD, FR1-TDD and FR2-TDD in a cell group. If not included, the UE supports SpCell on any serving cell with UL in supported band combinations.

1. The CRs R2-2108576 and R2-2108577 are not pursued.

On Q4, most of the companies expressed support for the current CRs, except two companies which stated that prefer explicitly list the capabilities that are applicable to the fallback definition. One of them further mentioned that it can follow majority, while the other stated that we cannot generalized fallback parameters and it would be risky to do it. However, considering that such generalization is also used for Feature set definition of fallback and most of the companies expressed support for the current CRs, we suggest to pursue those CRs with the suggested comments to improve the wording.

1. The CRs R2-2107977 and R2-2107978 are pursued, further comments can be addressed in phase 2.

## 2.2 Part 2: Intended to progress discussion on agreeable parts

Part 2 can be discussed with comments provided directly in the CRs suggested to be pursued.

# 3 Conclusion

Based on the discussion in the previous sections we propose the following:

[Proposal 1 The CRs R2-2108379, R2-2108380, R2-2108381 and R2-2108382 are not pursued.](#_Toc80276246)

[Proposal 2 The CRs R2-2108581, R2-2108582, R2-2108583 and R2-2108584 are pursued, further comments (if any) can be addressed in phase 2.](#_Toc80276247)

[Proposal 3 The CRs R2-2108576 and R2-2108577 are not pursued.](#_Toc80276248)

[Proposal 4 The CRs R2-2107977 and R2-2107978 are pursued, further comments can be addressed in phase 2.](#_Toc80276249)

# 4 References

1. R2-2108379 Resolving unclarity in fallback band combination definition, Ericsson, RAN2 #115-e, Aug 16th – 27th, 2021
2. R2-2108381 Resolving unclarity in fallback band combination definition, Ericsson, RAN2 #115-e, Aug 16th – 27th, 2021
3. R2-2108380 Resolving unclarity in fallback band combination definition, Ericsson, RAN2 #115-e, Aug 16th – 27th, 2021
4. R2-2108382 Resolving unclarity in fallback band combination definition, Ericsson, RAN2 #115-e, Aug 16th – 27th, 2021
5. R2-2108581 Correction on fallback band combination for SUL, Huawei, HiSilicon, RAN2 #115-e, Aug 16th – 27th, 2021
6. R2-2108582 Correction on fallback band combination for SUL, Huawei, HiSilicon, RAN2 #115-e, Aug 16th – 27th, 2021
7. R2-2108583 Correction on fallback band combination for SUL, Huawei, HiSilicon, RAN2 #115-e, Aug 16th – 27th, 2021
8. R2-2108584 Correction on fallback band combination for SUL, Huawei, HiSilicon, RAN2 #115-e, Aug 16th – 27th, 2021
9. R2-2108576 Clarifcation on BC fallback and spCellPlacement, Huawei, HiSilicon, RAN2 #115-e, Aug 16th – 27th, 2021
10. R2-2108577 Clarifcation on BC fallback and spCellPlacement, Huawei, HiSilicon, RAN2 #115-e, Aug 16th – 27th, 2021
11. R2-2106909 Reply LS on fallback applicability for FeatureSetDownLinkPerCC capability fields (R1-2106133; contact: ZTE), RAN2 #115-e, Aug 16th – 27th, 2021
12. R2-2107977 Definition of fallback per CC feature set, Ericsson, ZTE Corporation, Sanechips, RAN2 #115-e, Aug 16th – 27th, 2021
13. R2-2107978 Definition of fallback per CC feature set, Ericsson, ZTE Corporation, Sanechips, RAN2 #115-e, Aug 16th – 27th, 2021