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

Electronic Meeting, 24th February – 6th March 2020

Agenda: 5.4.3

Source: Ericsson

Title: [AT109e][008][NR15] Cap Discussion (Ericsson, Mediatek, Huawei, NTT docomo, Qualcomm, Nokia)

Document for: Discussion, Decision

# 1 Introduction

This document contains a list of TDocs to be discussed in the offline discussion below. Companies are invited to give their views on each TDoc submitted.

* [AT109e][008][NR15] Cap Discussion (Ericsson, Mediatek, Huawei, NTT docomo, Qualcomm, Nokia)

 Scope: Treat the documents [R2-2001322](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_109_e%5CDocs%5CR2-2001322.zip), [R2-2001224](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_109_e%5CDocs%5CR2-2001224.zip), [R2-2000425](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_109_e%5CDocs%5CR2-2000425.zip), R2-2000684, [R2-2001221](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_109_e%5CDocs%5CR2-2001221.zip), [R2-2000165](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_109_e%5CDocs%5CR2-2000165.zip), [R2-2002081](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_109_e%5CDocs%5CR2-2002081.zip), [R2-2000034](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_109_e%5CDocs%5CR2-2000034.zip), [R2-2001220](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_109_e%5CDocs%5CR2-2001220.zip), [R2-2000011](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_109_e%5CDocs%5CR2-2000011.zip).

 Intended outcome: First Round comments, goal to determine which of the CRs that we should attempt to agree, find candidates to leave out (postpone).

 Deadline: Feb 26 1200 CET

# 2 List of TDocs

Given companies input, the TDocs submitted below were sorted between “Easy to agree”, “Need further discussion in this meeting” and “Postpone”.

## 2.1 Easy to agree

### R2-2001220 related to LS-in, R2-2000011 from RAN1

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| **Company** | **Views** |
| Intel | Ok with this. |
| NTT DOCOMO | Agree on this CR |
| Qualcomm Incorporated | Support the CR. |
| Huawei | Agree. |
| MediaTek | Support the CR. |
| ZTE | Agree. |
| Samsung | Fine for this CR. Comments for editorials: typo For single carrier NR SA operation, the UE shall support a data rate for ~~that~~the carrier that is no smaller than the data rate computed using the above formula |
| Apple | Agree |

### R2-2000684

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| **Company** | **Views** |
| Nokia | Disagree, it is clear to us that the common fields must be used. |
| Intel | We think the CR is ok. |
| NTT DOCOMO | We also think that the CR is o.k to agree, since the intended behaviour becomes clearer. |
| Qualcomm Incorporated | Support the CR. |
| Huawei | Agree, the logic is similar as in EN-DC. |
| MediaTek | This is our CR. In response to Nokia, I guess there may be some misunderstanding. Yes, it is clear that common field must be used but we are not clarifying this part. We try to clarity that the SRB capability could also be included in NR DC IEUE-NR-Capability -> nrdc-Parameters -> *generalParametersNRDC*The current wording saying that --“The UE shall only set the bit in UE-MRDC-Capability -> generalParametersMRDC“. This prevent UE from including SRB capability in NR-DC IE, which is not intended behavior. Hope that this is more clear.  |
| ZTE | We are ok with the CR. |
| Ericsson | Agree with the intention.  |
| Samsung | Fine for this CR. |
| Apple | Agree with the CR. |

## 2.2 Need further discussion in this meeting

### R2-2001322

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| **Company** | **Views** |
| Nokia | Disagree. This seems tob pretty obvious that the procedure description was to be read with a given rat-type.Isn't this enough tht it is stated already in the description "This procedure is invoked once per requested rat-Type". |
| Intel | Agree with Nokia, not needed. |
| NTT DOCOMO | Disagree on the reason for change. In case of the example illustrated in the cover sheet, NR SA BC3 (band 5) is not regarded as the fallback of NE-DC BC1. As the definition gives, only the SCells can be removed for fallbacks. For the above case, the entire LTE SCG (L\_band1) is removed including PSCell, which is not regarded as fallback. The same story applies to NE-DC BC2 and NR SA BC4 in the figure. |
| Qualcomm Incorporated | Not needed. The intention is that the section 5.6.1.4 is called per RAT-type in section 5.6.1.3. |
| Huawei | For "This procedure is invoked once per requested rat-Type", my understanding is that the following procedure will be invoked multiple times according to the requested rat-Type, but before "1> if the requested rat-Type is xx: ", the procedure performed by UE is the same which is independent of rat-Type, so the "candidate band combinations" is the same. That’s why the featureSets is referenced from the "candidate feature set combinations" and can be consistent for different RATs.Based on definition in 38.306 "Fallback band combination: A band combination that would result from another band combination by releasing at least one SCell or uplink configuration of SCell, or SCG." It is the fallback if the entire LTE SCG is released.So we think the issue in the coversheet exsits. |
| MediaTek | Agree with DCM, fallback only refer to combination by releasing at least one SCell or uplink configuration of SCell, or SCG, not PCell, therefore, the examples are not considered as fallback. |
| ZTE | We share the same view with DCM. |
| Ericsson | We agree with the intended UE behaviour expressed by Huawei in their CR. Proposal text can be improved i.e. it seems not clear enough to say “with the same rat-Type“, but we can furhter improve this later on. |
| Samsung | We have same view with DCM. |
| Apple | Agree with DCM. |

### R2-2001224

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| **Company** | **Views** |
| Nokia | Partially agree to the issue but not to the proposed solution, but we don't need a new list indicator but just probably indicate that the index refers to a different BC list since a UE cannot be in NE-DC and other variant of DC at the same time? So, partially OK with the proposal but we don't need separate signalling. |
| Intel | Same comments as Nokia |
| NTT DOCOMO | Agree with Nokia, Intel |
| Qualcomm Incorporated | Prefer the original proposal in R2-2001224 becasue of its cleaness. It should be noted that CG-ConfigInfo can include multiple indices, from the original band combination list (which can include NE-DC band combiantion) and the NE-DC only band combinations. |
| Huawei | We share the same view with Qualcomm that even in one DC case (i.e. NE-DC), it is possible that NE-DC BC(s) in original BClist and NE-DC only BClist can be selected at the same time. If reuse the existing field, I understand it means there is a restriction that NE-DC BC(s) in only one BClist can be selected. If so, a new field indicating the selected list should be added. |
| ZTE | We agree with the intention of the CR, regarding Nokia’s comment , we understand the problem is that the UE will report two BC lists in UE capability, and one list applies to EN-DC and NE-DC capable BCs, the other BC list applies to NE-DC only capable BCs. So the MN/SN need to inform each other which BC list is referred to when transmiting the BC indexes.Regarding the CR content, we have following view/question:*For selectedBandCombination(NE-DC) in CG-Config:* We agree that the legacy field and new field cannot coexist at the same time.*For requestedBC-(NE-DC) in CG-Config:* We agree that the legacy field and new field cannot coexist at the same time. *For allowedBC-list(NE-DC) in CG-ConfigInfo:* Currently, it describes the restriction when one field is included and the other is not. We understand the network is allowed to include legacy and new fields at the same time. Is that correct understanding? |
| Samsung | We share the view of Qualcomm and Huawei. Introducing new list makes clear to handle the each case. |
| Apple | Share the view with Qualcomm and think the change in the CR is clear and friendly for readers. |

### R2-2000425

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| **Company** | **Views** |
| Nokia | Disagree. This is not correct as we think the BCs should not even be filled in. |
| Intel | We think there is scope for mis-alignment and are ok to see other company views, esp considering that this changes the procedural text of how UE prepares capability. |
| NTT DOCOMO | Agree on the proposed change. When NR-DC/NE-DC capable UE compiles a list of “candidate band combinations“, according to the procedure text, the UE included NR-DC/NE-DC band combinations. So, if capabilityRequestFilterCommon is not present, UE needs to remove them. So, we think that the CR is needed. |
| Qualcomm Incorporated | The issue raised by the CR is valid. Support the CR. |
| Huawei | Agree. |
| MediaTek | This is our CR. Without this change, we understand that the UE will incorrectly populate the NR-DC/NE-DC band combinations that should be excluded when the capabilityRequestFilterCommon is not present. |
| ZTE | Agree |
| Ericsson | Agree with the intention. But if in the future we add new filters to *capabilityRequestFilterCommon* we may forget again the procedures and we would have to see this kind of CR again. It could be easier to have a generic handling for *capabilityRequestFilterCommon* in the procedures and leave the details to the field description. Therefore we would suggest something as below.The UE shall:1> compile a list of "candidate band combinations" according to *capabilityRequestFilterCommon* (if included), and only consisting of bands included in *frequencyBandListFilter*, and prioritized in the order of *frequencyBandListFilter* (i.e. first include band combinations containing the first-listed band, then include remaining band combinations containing the second-listed band, and so on), where for each band in the band combination, the parameters of the band do not exceed *maxBandwidthRequestedDL*, *maxBandwidthRequestedUL*, *maxCarriersRequestedDL*, *maxCarriersRequestedUL*, *ca-BandwidthClassDL-EUTRA* or *ca-BandwidthClassUL-EUTRA*, whichever are received;1> for each band combination included in the list of "candidate band combinations":2> if the network (E-UTRA) included the *eutra-nr-only* field, or2> if the requested *rat-Type* is *eutra*:3> remove the NR-only band combination from the list of "candidate band combinations";NOTE 4: The (E-UTRA) network may request capabilities for *nr* but indicate with the *eutra-nr-only* flag that the UE shall not include any NR band combinations in the *UE-NR-Capability*. In this case the procedural text above removes all NR-only band combinations from the candidate list and thereby also avoids inclusion of corresponding feature set combinations and feature sets below.2> if it is regarded as a fallback band combination with the same capabilities of another band combination included in the list of "candidate band combinations":3> remove the band combination from the list of "candidate band combinations";~~1> if~~ *~~capabilityRequestFilterCommon~~* ~~is received:~~~~2> remove band combinations from the list of "candidate band combinations" in accordance with the given filter criteria in~~ *~~capabilityRequestFilterCommon~~*~~;~~ |
| Samsung | Disagree. Same view with Nokia.If UE receives the capabilityRequestFilterCommon in UECapabilityEnquiry message, UE follows the below field description i.e. include NE-DC, NR-DC, and omit EN-DC. It is general interpretation that UE will not create NE-DC and NR-DC BCs if UE is not received capabilityRequestFilterCommon. In other words, NR-DC and NE-DC BCs are considered only when UE receives capabilityRequestFilterCommon.The below text procedure is the case when omitEN-DC is indicated in capabilityRequestFilterCommon, so UE should remove the BCs according to field description. If this text procedure is not enough, we can further enhance the sentence.1> if *capabilityRequestFilterCommon* is received:2> remove band combinations from the list of "candidate band combinations" in accordance with the given filter criteria in *capabilityRequestFilterCommon*;The proposed change considers the case if capabilityRequestFilterCommon is not received.1>  else:2>  remove all NR-DC and NE-DC band combinations from the list of "candidate band combinations";As I said above, there are no NR-DC/NE-DC BCs to remove if UE is not received capabilityRequestFilterCommon. |
| Apple | Agree on the change. |

### R2-2001221

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| **Company** | **Views** |
| Intel | We think the CR is not needed, if the IE is absent, the UE does not support this feature. |
| NTT DOCOMO | Agree with Intel. According to the agreed UE feature list, the consequence of not supported is "PDSCH RE mapping is not supported", and hence it is strange to change the meaning to "support default RE mapping pattern". Even if this is not supported, gNb can configure PDSCH so that PDSCH and ZP/NZP CSI RS are not overlaped. So I think we can't say system is broken without this CR. |
| Qualcomm Incorporated | Agree with Intel and NTT DOCOMO. |
| MediaTek | Agree with above. |
| Ericsson | Our understanding is that this is a very basic feature and thus would have a default value supported by the UE. If this is not companies understanding, we think at least an LS should be sent to RAN1 to confirm this. Even though RAN1 feature list states for this case in “Consequences if the feature is not supported by the UE“ that “PDSCH RE mapping is not supported“, our understand is that this is not accurate (as we have identified in other cases as well), therefore, we could not rely solely on this to judge whether a default value is aplicable for this feature or not. |
| Samsung | CR is not needed. These capapbilities are mandatory with IOT signaling so UE should provide any values if UE passes the IOT test. So, we don’t have to define the default value i.e. minimum value, for this case. |
| Apple | Agree with Intel. |

### R2-2002080/R2-2002081 related to LS-in, R2-2000034 from RAN1

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| **Company** | **Views** |
| Intel | Our view is to get more clarification from RAN4.For us this LS has created quite a bit of ambiguity …!   It would have been easier if RAN4 just introduced contiguous intra-band operation on inter-band EN-DC combinations where there is frequency overlap between NR and LTE **(interpretation #1**). Then the introduction of the new feature would simply be covered using the below signaling and all the legacy UEs and gNBs would use the contiguous operation based on the new signaling. And without this signaling the non-contiguous means of operation is assumed. ***InterBandENDC-ContiguousSupport* ENUMERATED { supported}   OPTIONAL** But, it is not clear from the LS that RAN4 assumes the intra-band non-contiguous operation is already the working case for existing UEs and gNBs that support such inter-band EN-DC BCs.   “RAN4 has agreed that intra-band EN-DC requirements shall apply for inter-band EN-DC configurations where the frequency range of the E-UTRA band is a subset of the frequency range of the NR band”Does this mean that based on this agreement, a new set of requirements are applied to these inter-band EN-DC config? And among these new set of requirements, the ones related to non-contiguous operation are mandatory and contigous are optional…? **(interpretaion #2)**If yes, then the signaling from DCM would be useful, and for UEs which do not signal this IE, the new set of requirements do not apply. Another ambiguity if we assume that the second interpretaion is correct is the deployment of carriers for the legacy UE (the UE does not report this IE). Can the gNB configure contiguous and non-contiguous way for the carriers as it wishes, but the new requirements introduced in the LS are not applicable?  We hope it’s the first interpretation! But think more clarity is needed, as the current TP from DCM brings the question of what is the difference in UE behaviour if the UE reported that it only supports non-contiguous operation using new signaling vs the UE which does not report this IE. |
| Huawei | Agree that a CR is needed since it impacts on RAN2 spec based on RAN4 LS. The suggested sentence of reusing legacy field in RAN4 LS is not preferred considering NBC issue, an explicit indication may be a feasible way. The details can be discussed further. |
| MediaTek | Our understand is Intel’s interpretaion #2 and consdier DCM‘s CR correct. But also prefer to clarify the legacy UE/network behavior. |
| Apple | We tend to agree with Intel that both Interpretation #1 and #2 are possible. Perhaps more input from RAN4 is needed. |
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## 2.2 Postpone

### R2-2000165

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| **Company** | **Views** |
| Nokia | Please note we are waiting for RAN1 feedback on the LS we sent tot hem. The contribution is tentatively submitted to current meeting with the values based on our understanding of what defaults might be reasonable. |
| Intel | We think we can wait until the RAN1 feedback to conclude this then. |
| NTT DOCOMO | Agree with Intel. |
| Qualcomm Incorporated | Prefer to wait for RAN1, and have a single CR. The content of the current CR looks fine. |
| Huawei | Prefer to wait for RAN1 reply. |
| MediaTek | Agree with companies that we should wait for R1 response.On *maxSimultaneousResourceSetsPerCC*, the CR mandates UE to report value 1, but the correct udnerstanding should be the UE is mandated to report one or higher values. Also, for some mandatory field, it is redundant to add „.., the UE is mandated to report XXX or higher values.“ |
| ZTE | We are ok to wait for RAN1. |
| Samsung | We are also fine to wait RAN1 response. |
| Apple | Prefer wait for RAN1 response. |

Rapporteur suggestion: Wait for RAN1 reply.

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# 3 Conclusion

In the previous sections we made the following observations:

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

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