**3GPP TSG RAN WG2 Meeting #111-e R2-2008407
E-Conference, August 17th to August 28th 2020**

**Agenda item: 6.1.2**

**Source: Nokia, Nokia Shanghai Bell**

**Title: Summary of [AT111-e] [020] [NR16] UE cap RF FR2 (Nokia)**

**Document for: Discussion and Decision**

1. Introduction

RF FR2

* [AT111-e][020][NR16] UE cap RF FR2 (Nokia)

 Scope: Treat R2-2007403, R2-2007082, R2-2007083, R2-2007380, R2-2007381

 Deadlines: Short UE Caps

Dl only spectrum, moved from 6.15

[R2-2007403](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_111-e%5CDocs%5CR2-2007403.zip) DL-only spectrum Ericsson, Apple discussion Rel-16 NR\_RF\_FR2\_req\_enh-Core

[R2-2007082](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_111-e%5CDocs%5CR2-2007082.zip) Introduction on frequency separation class for DL-only FR2 spectrum Apple, Ericsson CR Rel-16 38.306 16.1.0 0371 - F TEI16, NR\_RF\_FR2\_req\_enh

[R2-2007083](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_111-e%5CDocs%5CR2-2007083.zip) Introduction on frequency separation class for DL-only FR2 spectrum Apple, Ericsson CR Rel-16 38.331 16.1.0 1784 - F TEI16, NR\_RF\_FR2\_req\_enh

Suspend IBE requirements, moved from 6.15

[R2-2007380](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_111-e%5CDocs%5CR2-2007380.zip) Uplink power boosting via suspended IBE requirements Nokia, Nokia Shanghai Bell CR Rel-16 38.331 16.1.0 1840 - B NR\_RF\_FR2\_req\_enh

[R2-2007381](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_111-e%5CDocs%5CR2-2007381.zip) Uplink power boosting via suspended IBE requirements Nokia, Nokia Shanghai Bell CR Rel-16 38.306 16.1.0 0379 - B NR\_RF\_FR2\_req\_enh

2. Discussions

## Contact list of delegates

To make it easier to find the correct contact delegate in each company for potential follow-up questions, the rapporteur encourages the delegates who provide input to provide their contact information in this table:

|  |  |
| --- | --- |
| Company | Delegate contact |
| Nokia, Nokia Shanghai Bell | Amaanat Ali (amaanat.ali@nokia.com) |
| Ericsson | Mattias Bergström (mattias.a.bergstrom@ericsson.com |
| Qualcomm Incorporated | Masato Kitazoe (mkitazoe [at] qti.qualcomm.com |
| Huawei, HiSilicon | Yiru Kuang (kuangyiru@huawei.com) |
| Intel | Youn Heo (young.hyoung.heo@intel.com) |
| Futurewei | Hao Bi (hao.bi@futuewei.com) |
| CATT | Da Wang (wangda@catt.cn) |
| OPPO | Qianxi Lu (qianxi.lu@oppo.com) |
| Samsung | Soenghun Kim (kimsh23@samsung.com) |

## 2.0 Discussion on [R2-2007403](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_111-e%5CDocs%5CR2-2007403.zip)

[R2-2007403](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_111-e%5CDocs%5CR2-2007403.zip) DL-only spectrum Ericsson, Apple discussion Rel-16 NR\_RF\_FR2\_req\_enh-Core

|  |  |
| --- | --- |
| Company | Feedback |
| Ericsson | Background to the paper: The intention of the paper is to ensure that companies in RAN2 have a common understanding of what RAN4 is requesting. If they agree to what is written in this contribution, we assume the following CRs will be agreeable too. |
| Nokia | Agree with the intention |

## 2.1 Discussion on CRs [R2-2007082](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_111-e%5CDocs%5CR2-2007082.zip) and [R2-2007083](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_111-e%5CDocs%5CR2-2007083.zip)

The following documents are relevant for the discussion:

Dl only spectrum, moved from 6.15

[R2-2007082](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_111-e%5CDocs%5CR2-2007082.zip) Introduction on frequency separation class for DL-only FR2 spectrum Apple, Ericsson CR Rel-16 38.306 16.1.0 0371 - F TEI16, NR\_RF\_FR2\_req\_enh

[R2-2007083](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_111-e%5CDocs%5CR2-2007083.zip) Introduction on frequency separation class for DL-only FR2 spectrum Apple, Ericsson CR Rel-16 38.331 16.1.0 1784 - F TEI16, NR\_RF\_FR2\_req\_enh

|  |  |
| --- | --- |
| Company | Feedback |
| Nokia | CRs intent is fine for us. Good proposals from Intel and Huawei which help clarifying the purpose of the additional capability. |
| Ericsson | Agree@Intel: It is also our understanding that if the UE indicates intraBandFreqSeparationDL-Only-r16 the UE shall also indicate *intraBandFreqSeparationDL.* We actually think it is already clear from the current CR since it says that the DL-only field extends the legacy field. But if companies want to include such a statement, that would be fine. |
| Qualcomm Incorporated | Agree to the content. The title of the CR should be corrected to cover paired bands. |
| Huawei, HiSilicon | Generally fine with the CRs, please see a wording change suggested as below, since it is an optional feature, if the UE does not report the field *intraBandFreqSeparationDL-Only-r16*, it means UE does not support frequency separation class for DL only frequency spectrum, instead of applying any default value.“Indicates whether the UE supports frequency separation class of DL only extension. If present, the field extends the maximum frequency separation between the lower edge of lowest CC and the upper edge of highest CC in a frequency band that the UE supports according to *intraBandFreqSeparationDL*.The frequency range extension is either above or below the frequency range indicated by *intraBandFreqSeparationDL* and extends it in contiguous manner with no frequency gap, and the network may configure contiguous or non-contiguous downlink serving cells in that extended range.” |
| Intel | Agree.One question for clarification is whether the UE should indicate *intraBandFreqSeparationDL* if the UE supports intraBandFreqSeparationDL-Only-r16. If yes, it might be good to explicitly mention.  |
| Futurewei | Would like to have some clarification to understand the sentence “The UE sets the same value in the FeatureSetDownlink of each band entry within a band” – would there be multiple band entries within a band? My understanding is that a band entry is used to point to a band in a band combination.Is the intention of the sentence –1. All bands in a band combination use the same value, i.e., “The UE sets the same value in the FeatureSetDownlink of each band entry within a band combination”; or
2. The same value is used for a band in all band combinations that involve this band?
 |
| CATT | We are generally fine with the CRs and agree the suggestion changes made by Huawei. |
| OPPO | Agree.On the other hand, we wonder if there is a need to highlight the network configuration flexibility here “the network may configure contiguous or non-contiguous downlink serving cells in that extended range”, although we share the same understanding of (non)contiguous feasibility. In other words, we anyway cannot exhaust all feasible configuration options by network.For the issue raised by Futurewei, our understanding is it is for the band entries for the same band in a BC entry, i.e., intra-band non-contiguous CA scenario.And we wonder if the following text “The sum of *intraBandFreqSeparationDL* and *intraBandFreqSeparationDL-Only* shall not exceed 2400 MHz. If the UE sets this field, the sum of *intraBandFreqSeparationDL* and *intraBandFreqSeparationDL-Only* shall be larger than 1400 MHz.” needs to be further clarified on whether we meant for ***intraBandFreqSeparationDL*** with and/or without suffix |
| Samsung | Agree in general. Huawei’s suggestion looks good. |
| Apple | Comments from Qualcomm, Intel, Huawei are addressed in the updated CR(s).For the question from Futurewei, we share the same understanding as OPPO. And please note it actually followed the description in legacy fields *intraBandFreqSeparationDL* and intraBandFreqSeparationUL.For OPPO’s first comment, I tend to keep it as that was the main appeal from R2-2007403. For the second comment, my personal understanding is if we do not add “with or without suffix”, it means both IE(s) with or without suffix apply. Thanks for all the comments.  |

**Proposal 1: Pursue** [**R2-2007082**](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_111-e%5CDocs%5CR2-2007082.zip) **and** [**R2-2007083**](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_111-e%5CDocs%5CR2-2007083.zip)**. Proponent company to produce agreeable version after incorporating text updates from the discussion.**

## 2.2 Discussion on CRs [R2-2007380](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_111-e%5CDocs%5CR2-2007380.zip) and [R2-2007381](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_111-e%5CDocs%5CR2-2007381.zip)

The following documents are relevant for the discussion:

Suspend IBE requirements, moved from 6.15

[R2-2007380](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_111-e%5CDocs%5CR2-2007380.zip) Uplink power boosting via suspended IBE requirements Nokia, Nokia Shanghai Bell CR Rel-16 38.331 16.1.0 1840 - B NR\_RF\_FR2\_req\_enh

[R2-2007381](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_111-e%5CDocs%5CR2-2007381.zip) Uplink power boosting via suspended IBE requirements Nokia, Nokia Shanghai Bell CR Rel-16 38.306 16.1.0 0379 - B NR\_RF\_FR2\_req\_enh

|  |  |
| --- | --- |
| Company | Comments |
| Nokia, Nokia Shanghai Bell | Proponent |
| Ericsson | Agree |
| Qualcomm Incorporated | We should wait for RAN4's feature list (FG 8-7 currently FFS) and RRC parameter list. We prefer per band UE capability signalling, and propose the same in RAN4.General approach to have network configuration and UE capability looks fine. |
| Huawei, HiSilicon | Based on the feedback from our RAN4 colleague, the RAN4 work on this topic is not finished, suggest to postpone and wait for RAN4 progress. |
| Intel  | Agree to wait until RAN4 conclude it.  |
| Futurewei | Share the same view that we can wait for RAN4 conclusion. |
| CATT | Same view that we should wait for RAN4. |
| OPPO | Share the same view that we can wait for RAN4 conclusion. |
| Samsung | Should wait for RAN4 |
| Apple | Fine with waiting for RAN4 input. |

**For the IBE topic, it is the rapporteur understanding that RAN4 decided to introduce the feature but final confirmation is still pending.**

**Proposal 2: Pursue the CRs** [**R2-2007380**](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_111-e%5CDocs%5CR2-2007380.zip) **and** [**R2-2007381**](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_111-e%5CDocs%5CR2-2007381.zip) **and provide RAN2 signalling after RAN4 confirmation.**

# 3. Conclusion

Thanks to all the companies who participated in the discussion:

**Proposal 1: Pursue** [**R2-2007082**](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_111-e%5CDocs%5CR2-2007082.zip) **and** [**R2-2007083**](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_111-e%5CDocs%5CR2-2007083.zip)**. Proponent company to produce agreeable version after incorporating text updates from the discussion.**

**For the IBE topic, it is the rapporteur understanding that RAN4 decided to introduce the feature but final confirmation is still pending.**

**Proposal 2: Pursue the CRs** [**R2-2007380**](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_111-e%5CDocs%5CR2-2007380.zip) **and** [**R2-2007381**](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_111-e%5CDocs%5CR2-2007381.zip) **and provide RAN2 signalling after RAN4 confirmation.**

# References

RF FR2

* [AT111-e][020][NR16] UE cap RF FR2 (Nokia)

 Scope: Treat R2-2007403, R2-2007082, R2-2007083, R2-2007380, R2-2007381

 Deadlines: Short UE Caps

Dl only spectrum, moved from 6.15

[R2-2007403](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_111-e%5CDocs%5CR2-2007403.zip) DL-only spectrum Ericsson, Apple discussion Rel-16 NR\_RF\_FR2\_req\_enh-Core

[R2-2007082](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_111-e%5CDocs%5CR2-2007082.zip) Introduction on frequency separation class for DL-only FR2 spectrum Apple, Ericsson CR Rel-16 38.306 16.1.0 0371 - F TEI16, NR\_RF\_FR2\_req\_enh

[R2-2007083](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_111-e%5CDocs%5CR2-2007083.zip) Introduction on frequency separation class for DL-only FR2 spectrum Apple, Ericsson CR Rel-16 38.331 16.1.0 1784 - F TEI16, NR\_RF\_FR2\_req\_enh

Suspend IBE requirements, moved from 6.15

[R2-2007380](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_111-e%5CDocs%5CR2-2007380.zip) Uplink power boosting via suspended IBE requirements Nokia, Nokia Shanghai Bell CR Rel-16 38.331 16.1.0 1840 - B NR\_RF\_FR2\_req\_enh

[R2-2007381](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_111-e%5CDocs%5CR2-2007381.zip) Uplink power boosting via suspended IBE requirements Nokia, Nokia Shanghai Bell CR Rel-16 38.306 16.1.0 0379 - B NR\_RF\_FR2\_req\_enh

MPE, copied here from 6.15 only for reference – Treated separately in AI 6.15

[R2-2008096](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_111-e%5CDocs%5CR2-2008096.zip) Implementing MPE enhancements Ericsson CR Rel-16 38.306 16.1.0 0322 1 B NR\_RF\_FR2\_req\_enh R2-2004939 Late