3GPP TSG-RAN WG2 #113bis-e electronic R2-210xxxx

Electronic Meeting, 12th – 20th April, 2021

Agenda Item: 6.1.4.3

Source: Intel Corporation

Title: [AT113bis-e][023][NR16] Summary of UE Caps (Intel)

Document for: Discussion, Decision

# 1 Introduction

This contribution summarizes the following discussion:

* [AT113bis-e][023][NR16] UE caps (Intel)

Scope: Treat R2-2102868, R2-2103734, R2-2103764, R2-2102879, R2-2103137, R2-2103669,

Phase 1, determine agreeable parts, Phase 2, for agreeable parts Work on CRs.

Intended outcome: Report and Agreed-in-principle CRs, if any

Deadline:

  Initial deadline for companies’ comments (Phase 1): **Wednesday April 14 1000 UTC**

  Deadline for CR finalization (Phase 2): **Monday April 19 1800 UTC**

The following documents are treated in this discussion:

R2-2102868 Miscellaneous corrections to Rel-16 UE capabilities Intel Corporation CR Rel-16 38.306 16.4.0 0541 - F LTE\_NR\_DC\_CA\_enh

R2-2103734 UE Feature list for NR Rel-16 Intel Corporation CR Rel-16 38.822 15.0.1 0004 - B TEI16

R2-2102879 Correction on Capability of two PUCCH transmission OPPO CR Rel-16 38.306 16.4.0 0542 - F NR\_L1enh\_URLLC-Core

R2-2103137 Correction on IAB in TS 38.306 ZTE, Sanechips CR Rel-16 38.306 16.4.0 0546 - F NR\_IAB-Core

R2-2103669 Support of MAC subheaders with one-octet eLCID field Lenovo, Motorola Mobility discussion Rel-16 TEI16

R2-2103764 Correction to Multi-PUSCH UL grant Ericsson CR Rel-16 38.306 16.4.0 0556 - F NR\_unlic-Core

Contact person(s) for each participating company:

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

## 2.1 Phase 1: Intended to determine agreeable parts

The proposals listed in this subsection 2.1 are extracted from CRs to facilitate the discussion and follow the numbering of the corresponding TDoc from which they were extracted (i.e. they do not represent actual proposals from this TDoc, which should be listed in subsection 2.2).

### 2.1.1 Miscellaneous corrections to Rel-16 UE capabilities

In R2-2102868, the following are provided in the reasons for change and summary of change respectively:

1. Missing prerequisite in the field description of bwp-SwitchingMultiCCs-r16 as highlighted in R4 9-1:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 9-1 | BWP switching on multiple CCs RRM requirements | Incremental delay for BWP switch processing on additional CCs in timer/DCI based simultaneous BWP switching on multiple CCs | RAN1 feature 6-2, 6-3, 6-4 specified in TR 38.822 | For component 2), the candidate values are:   * {100us, 200us} for UE indicates type1 in bwp-SwitchingDelay * {200us, 400us, 800us, 1000us} for UE indicates type 2 in bwp-SwitchingDelay   The total BWP switching delay will be captured in TS38.133  UE needs to indicate either of the candidate values in case it supports CA | Optional with capability signalling |

1. Add the prerequisite to the bwp-SwitchingMultiCCs-r16

**Q1 Do companies agree to the proposed changes in the CR? For companies agreeing to the proposed changes, please also comment on the contents of the CR, if any.**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| Intel | Yes (Proponent) |  |
| Lenovo | Yes | Further minor editorial issues can be fixed in the rapporteur CR:   * In the description of extendedDiscardTimer-r16, extendedT-PollRetransmit-r16, extendedT-StatusProhibit-r16 the reference to TS 38.331 [2] needs to be corrected to [9]. * In the description of spatialRelationsSRS-Pos-r16 the entry in „FR1-FR2 DIFF“ should say „FR2 only“. As result, we wonder whether the sentence „It is only applicable for FR2,“ can be removed. |
| Huawei, HiSilicon | Yes |  |
| MediaTek | Yes |  |
| Qualcomm Incorporated | Yes |  |

### 2.1.2 Correction on Capability of two PUCCH transmission

In R2-2102879, the following are provided in the reason for change and the summary of change, respectively on corrections on the field description of the capability of 2 PUCCH transmission:

1. In twoPUCCH-TypeX-r16 (X=1,2,5,6,7), it did not mention in what time granularity where the two PUCCH should be supported.
2. In twoPUCCH-TypeX-r16 (X=2, 7), it did not mention the “consecurtive symbols” for supporting the two PUCCH. Without this restriction, it is logically wrong since there would be no missing case left for twoPUCCH-TypeX-r16 (X=4, 11) which is supposed to support the non-consecutive case on top of X=2,7.
3. In twoPUCCH-TypeX-r16 (X=3,4), it is wrong to use the plural, since it is for a single codebook.
4. In twoPUCCH-TypeX-r16 (X=5,6,8,10), it is for two codebooks where one of the two is sub-slot based codebook, but did not mention the other codebook is slot or sub-slot based codebook. Considering that they are all dependent on 11-4, which is for “Two HARQ-ACK codebooks with up to one sub-slot based HARQ-ACK codebook (i.e. slot-based + slot-based, or slot-based + sub-slot based) simultaneously constructed for supporting HARQ-ACK codebooks with different priorities at a UE”, it can be derived that they are for slot-based + sub-slot-based case.
5. In twoPUCCH-Type8-r16, it is for two codebooks, but the number “two” is missing.
6. In twoPUCCH-Type10-r16, it is for the others cases not covered by In twoPUCCH-Type5/7-r16, but type10 is for 2\*7-symbol case + 1 sub-slot based and 1 slot-based codebook case, while type5 is for 7\*2-symbol case, and type7 is for two sub-slot based case, so there are no overlapping case.
7. In twoPUCCH-Type11-r16, it is for the others cases not covered by In twoPUCCH-Type6/8-r16, but type11 is for 2 sub-slot based codebook case, while type6/8 are for 1 sub-slot based and 1 slot-based codebook, so no overlapping.
8. In twoPUCCH-TypeX-r16 (X=1,2,5,6,7), add “in the same subslot” to restrict the time granularity where the two PUCCH should be supported.
9. In twoPUCCH-TypeX-r16 (X=2, 7), add the restriction of “consecurtive symbols” for supporting the two PUCCH.
10. In twoPUCCH-TypeX-r16 (X=3,4), change the plural to singular.
11. In twoPUCCH-TypeX-r16 (X=5,6,8,10), add the restriction that they are for two codebooks where one of the two is sub-slot based codebook, and the other is slot based codebook.
12. In twoPUCCH-Type8-r16, clarify it is for “two” codebooks.
13. Correct that type10 is to cover the missing case in type6 and type8.
14. Correct that type11 is to cover the missing case in type7 and type9.

**Q2.1 Do companies agree with the proposed changes in the CRs? For companies agreeing to the proposed changes, please also comment on the contents of the CR, if any.**

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| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| Intel | Postpone the CR | Our understanding is that these changes are also discussed in RAN1, it will be good if these changes are first reflected in the RAN 1 feature list. Hence we propose to wait for the feature list updates from RAN1 before making any changes. |
| Huawei, HiSilicon | Postpone the CR | We undersrtand RAN1 is discussing this issue, so we can wait for RAN1 conclusion. |
| Qualcomm Incorpoated | No | The current text captures what RAN1 has indicated in their feature list. If any change, RAN1 should tell us. |
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### 2.1.3 Correction on IAB in TS 38.306

In R2-2103137, the following are provided in the summary of change:

:

1. Correct “Table 4.2.11.1-1, Table 4.2.11.1-2 and Table 4.2.11.1-3” to “Table 4.2.15.1-1, Table 4.2.15.1-2 and Table 4.2.15.1-3”
2. Correct the title of the table “Table 4.2.11.1-3: RF/RRM mandatory features for IAB-MT” to “Table 4.2.15.1-3: RF/RRM mandatory features for IAB-MT”

The changes are quite editorial and if agreed, should be merged with the rapporteur miscellaneous correction CR R2-2102868.

**Q3 Do companies agree with the proposed changes in the CR? For companies agreeing to the proposed changes, please also comment on the contents of the CR, if any. Should it be merged with rapporteur miscellaneous correction CR?**

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| --- | --- | --- | --- |
| **Company** | **Yes/No** | **Merged with Rapp’s misc correction CR** R2-2102868 | **Comments** |
| Intel | Yes | Yes |  |
| Lenovo | Yes | Yes |  |
| Huawei, HiSilicon | Yes | Yes |  |
| Qualcomm Incorporated | Yes | Yes |  |
|  |  |  |  |

### 2.1.4 Support of MAC subheaders with one-octet eLCID field

In R2-2103669, it discusses the options for specifying the conditionally mandatory support of the new MAC subheaders with one-octet eLCID field:

:

**Option 1: Introduction as a conditionally mandatory feature**

The MAC subheaders with one-octet eLCID is specified as a conditionally mandatory feature in TS 38.306, clause 6 with below description.

| **Features** | **Condition** |
| --- | --- |
| MAC subheaders with one-octet eLCID field | It is mandatory to support MAC subheaders with one-octet eLCID field for UEs supporting MAC CEs using extended LCID values as specified in TS 38.321 [8]. |

**Option 2: Introduction of a new capability bit**

1. Introduce in TS 38.331 the capability ***lcid-Extension-r16*** in IE *UE-NR-Capability* as part of IE *MAC-ParametersCommon*.
2. Introduce in TS 38.306 the below description of the capability ***lcid-Extension-r16*** in 4.2.15.6 MAC Parameters.

| **Definitions for parameters** | **Per** | **M** | **FDD-TDD**  **DIFF** | **FR1-FR2**  **DIFF** |
| --- | --- | --- | --- | --- |
| ***lcid-Extension-r16***  Indicates whether the UE supports the MAC subheaders with one-octet eLCID field, as specified in TS 38.321 [8]. A UE shall set this field if it supports MAC CEs using extended LCID values. | UE | CY | No | No |

From rapporteur point of view, conditional mandatory feature is normally introduced in Clause 6 in TS38.306 and hence think that Option 1 is sufficient.

**Q4.1 Do companies agree with Option 1 or 2?**

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| --- | --- | --- |
| **Company** | **Option 1 or Option 2** | **Comments** |
| Intel | Option 1 | Agree with the rapporteur’s view |
| Lenovo | Option 1 | Proponent and option 1 looks sufficient. |
| Huawei, HiSilicon | Option 1 | Agree with the rapporteur’s view. |
| MediaTek | Option 2 | We somehow think explict capability bit is more clear but option 1 would also be accetable to us. |
| Qualcomm Incorporated | Neither | It is sufficiently clear from MAC specification that eLCID is necessary sinalling format the UE must support for a given MAC-CE. |

### 2.1.5 Correction to Multi-PUSCH UL grant

R2-2103764 has the following reason for change:

:

In RAN1 feature list (R1-2102006), the NR unlicensed features defined per band that are applicable only to unlicensed bands have the following notes (or similar):

“the signaling is per band but is only expected for a band where shared spectrum channel access must be used”;

For the cases where a feature is also applicable to frequency bands that does not require shared spectrum access, no further restriction was captured in the RAN1 feature list.

Consequently, Multi-PUSCH UL grant should be considered as also applicable to frequency bands that do not require shared spectrum access, since it does not contain any restriction in each description in RAN1 feature list (R1-2102006).

The changes are quite editorial and if agreed, should be merged with the rapporteur miscellaneous correction CR.

**Q5.1 Do companies agree with the proposed changes in the CRs? For companies agreeing to the proposed changes, please also comment on the contents of the CR, if any. Also should it be merged with rapporteur miscellaneous correction CR?**

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| --- | --- | --- | --- |
| **Company** | **Yes/No** | **Merged with Rapp’s misc correction CRs** | **Comments** |
| Intel | Yes | Yes |  |
| Huawei, HiSilicon | Yes | Yes |  |
| MediaTek | Yes | Yes |  |
| Qualcomm Incorporated | Yes | Yes |  |
|  |  |  |  |

### 2.1.6 Rel-16 UE feature list CR

R2-2103734 contains the Rel-16 UE feature from RAN1, RAN2 and RAN4. It incorporated the latest updated Ran1 feature list (R1-2102006) as well as the latest RAN4 feature list (R4-2103367).

**Q1 Do companies agree to the proposed changes in the CR?**

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| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| Intel | Yes (Proponent) |  |
| Lenovo |  | We have spotted some issues:   * References: there are some issues with the references specified:   + References [6] and [8] are not used.   + 2-18: reference [4] to TS 38.101-3 needs to be removed. Can think of introducing new reference for 38.101-3 but think this is unnecessary.   + 16-x RAN2: reference [8] to 38.321 needs to be corrected to [10]; reference [9] to 38.331 needs to be corrected to [2].   + 18-10: reference [5] to 38.133 needs to be removed. Can think of introducing new reference for 38.133 but think this is unnecessary.   + 24-10: reference [15] for 36.306 needs to be corrected to [14]. * 22-8c: “3-5a” should be removed from “Prerequisite FGs” (was an issue in the RAN1 feature list itself). * 22-10: in 38.331 the candidate values were specified as {mode2, mode3}. |
| Qualcomm Incorparated | Yes |  |
|  |  |  |
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**For companies agreeing to the proposed changes, please also comment on the contents of the CR, if any.**

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| --- | --- | --- | --- | --- |
| **Company** | **Feature no.** | **Comment raised** | **Proposals** | **Rapporteur’s resolution** |
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## 2.2 Phase 2: Intended to progress discussion on agreeable parts

- To be updated after discussion on Phase 1 -

# 3 Conclusion

- To be updated after discussion on Phase 1 -