3GPP TSG-RAN WG2 #114-e electronic R2-210xxxx

Electronic Meeting, 19th – 27th May, 2021

Agenda Item: 6.1.4.3

Source: Intel Corporation

Title: [AT114-e][023][NR16] Summary of UE Caps (Intel)

Document for: Discussion, Decision

# 1 Introduction

This contribution summarizes the following discussion:

* [AT114-e][023][NR16] UE capabilities (Intel)

Scope: Treat R2-2104716, R2-2104727, R2-2104884, R2-2104885, R2-2105177, R2-2105178, R2-2105063, R2-2105094, R2-2105095, R2-2105711, R2-2104916, R2-2104917, R2-2104722, R2-2105715, R2-2105247, R2-2105716, R2-2105717, R2-2106316, R2-2104829, R2-2105359, R2-2105360, R2-2105361, R2-2105362

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

Intended outcome: Report and Agreed CRs.

Deadline: Schedule A

  Initial deadline for companies’ comments (Phase 1): **Friday May 21 1000 UTC**

  Deadline for CR finalization (Phase 2): **Wednesday May 26 1200 UTC**

The following documents are treated in this discussion:

2 PUCCH capability

[1] R2-2104829 Left issue on two PUCCH capability OPPO discussion Rel-16 NR\_L1enh\_URLLC-Core

R1 and R4 feature list updates

[2] R2-2104884 Release-16 UE capabilities based on RAN1 and RAN4 feature lists Intel Corporation CR Rel-16 38.306 16.4.0 0573 - F NR\_eMIMO-Core, NR\_IIOT-Core, LTE\_NR\_DC\_CA\_enh-Core, NR\_L1enh\_URLLC-Core, NR\_HST-Core, TEI16

[3] R2-2104885 Release-16 UE capabilities based on RAN1 and RAN4 feature lists Intel Corporation CR Rel-16 38.331 16.4.1 2585 - F NR\_eMIMO-Core, NR\_HST-Core, TEI16

[4] R2-2105177 CR on the Updated RAN1/4 Features -38306 ZTE Corporation, Sanechips CR Rel-16 38.306 16.4.0 0579 - F TEI16

[5] R2-2105178 CR on the Updated RAN1/4 Features -38331 ZTE Corporation, Sanechips CR Rel-16 38.331 16.4.1 2606 - F TEI16

Tx Diversity capability

[6] R2-2104916 CR on 38.306 for the capability of supporting txDiversity vivo CR Rel-16 38.306 16.4.0 0574 - C TEI16

[7] R2-2104917 CR on 38.331 for the capability of supporting txDiversity vivo CR Rel-16 38.331 16.4.1 2589 - C TEI16

[8] R2-2105711 Discussion on signalling design for TxD capability Huawei, HiSilicon discussion Rel-16 TEI16

NR-u corrections

[9] R2-2105063 Corrections on the Shared Spectrum Channel Access Parameters CATT CR Rel-16 38.306 16.4.0 0577 - F NR\_unlic-Core

New HST capabilities

[10] R2-2105094 Introduction of the intra-NR and inter-RAT HST Capabilities Apple, OPPO, CATT, Nokia, Nokia Shanghai Bell, Ericsson CR Rel-16 38.306 16.4.0 0578 - F NR\_HST-Core

[11] R2-2105095 Introduction of the intra-NR and inter-RAT HST Capabilities and Configuration Apple, OPPO, CATT, Nokia, Nokia Shanghai Bell, Ericsson CR Rel-16 38.331 16.4.1 2599 - F NR\_HST-Core

Capability support of one-octet eLCID for IAB MT

[12] R2-2105359 Capability of supporting one-octet eLCID in IAB vivo discussion

[13] R2-2105360 Capability of supporting one-octet eLCID in IAB - Option A vivo CR Rel-16 38.306 16.4.0 0583 - F NR\_IAB-Core

[14] R2-2105361 Capability of supporting one-octet eLCID in IAB - Option B vivo CR Rel-16 38.306 16.4.0 0584 - F NR\_IAB-Core

[15] R2-2105362 Capability of supporting one-octet eLCID in IAB - Option B vivo CR Rel-16 38.331 16.4.1 2620 - F NR\_IAB-Core

New frequency separation classes

[16] R2-2105715 Discussion on introduction of new frequency separation classes Huawei, HiSilicon discussion Rel-16 TEI16

[17] R2-2105716 CR on introduction of new frequency separation classes Huawei, HiSilicon CR Rel-16 38.306 16.4.0 0591 - F TEI16

[18] R2-2105717 CR on introduction of new frequency separation classes Huawei, HiSilicon CR Rel-16 38.331 16.4.1 2643 - F TEI16

[19] R2-2105247 Adding 400 Mhz and 600 MHz frequency separation classes Ericsson, Nokia, Nokia Shanghai Bell, Qualcomm Incorporated CR Rel-16 38.331 16.4.1 2609 - C NR\_RF\_FR2\_req\_enh2

TPMI group signalling correction

[20] R2-2106316 Correction on TPMI group signaling for UL full power transmission Samsung CR Rel-16 38.306 16.4.0 0602 - F NR\_eMIMO-Core

Updated Rel-16 feature list

[21] R2-2104890 UE Feature list for NR Rel-16 Intel Corporation CR Rel-16 38.822 15.0.1 0004 2 B TEI16 R2-2104554

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|  |  |
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# 2 Discussion

## 2.1 Phase 1: Intended to determine agreeable parts

### 2.1.1 Leftover issue on 2 PUCCH capability

In RAN1 LS (R1-2104121), RAN1 ask RAN2 to check if following sentences (highlighted red) in TS38.306 in current places are appropriate considering restriction on FG 11-4c/4d/4f/4h is for for two codebooks where one of the two is sub-slot based codebook, and the other is slot-based codebook. If not appropriate, RAN2 can consider editing sentences.

***twoPUCCH-Type5-r16***

Indicates whether the UE supports two PUCCH of format 0 or 2 for two HARQ-ACK codebooks with one 7\*2-symbol subslot based HARQ-ACK codebook. When simultaneously configured with two slot-based HARQ-ACK codebooks, the capability for each HARQ-ACK codebook is subjected to the capability reported by *twoPUCCH-F0-2-ConsecSymbols.*

***twoPUCCH-Type6-r16***

Indicates whether the UE supports two PUCCH of format 0 or 2 in consecutive symbols for two HARQ-ACK codebooks with one 2\*7-symbol subslot based HARQ-ACK codebook. When simultaneously configured with two slot-based HARQ-ACK codebooks, the capability for each HARQ-ACK codebook is subjected to the capability reported by twoPUCCH-F0-2-ConsecSymbols.

***twoPUCCH-Type8-r16***

Indicates whether the UE supports one PUCCH format 0 or 2 and one PUCCH format 1, 3 or 4 in the same subslot for HARQ-ACK codebooks with one 2\*7-symbol subslot based HARQ-ACK codebook. When simultaneously configured with two slot-based HARQ-ACK codebooks, the capability for each HARQ-ACK codebook is subjected to the capability reported by onePUCCH-LongAndShortFormat.

***twoPUCCH-Type10-r16***

Indicates whether the UE supports two PUCCH transmissions in the same subslot for two HARQ-ACK codebooks with one 2\*7-symbol subslot which are not covered by *twoPUCCH-Type5-r16* and *twoPUCCH-Type7-r16*. When simultaneously configured with two slot-based HARQ-ACK codebooks, the capability for each HARQ-ACK codebook is subjected to the capability reported by *twoPUCCH-AnyOthersInSlot.*

3 alternatives are disucssed in R2-2104829:

Alt-1: keep the sentence in the original place, which means that the related behaviour (i.e., two A/N-related slot-based PUCCHs in the same slot) is covered by twoPUCCH-TypeX-r16 (X=5,6,8,10).

Alt-2: By introducing new capability bit, the related capability can be separated from the FG 11-4c, FG11-4d, FG 11-4f and FG 11-4h

Alt-3: relocate the sentences all into the following capability:

| ***twoHARQ-ACK-Codebook-type1-r16***  Indicates whether the UE supports two HARQ-ACK codebooks with up to one subslot based HARQ-ACK codebook (i.e. slot-based + slot-based, or slot-based + subslot based) simultaneously constructed for supporting HARQ-ACK codebooks with different priorities at a UE. The capability signalling comprises the following parameters:  - *sub-SlotConfig-NCP-r16* indicates the maximum number of actual PUCCH transmissions for HARQ-ACK within a slot for NCP with 2-symbol\*7 sub-slot configuration;  - *sub-SlotConfig-ECP-r16* indicates the maximum number of actual PUCCH transmissions for HARQ-ACK within a slot for ECP with 2-symbol\*6 sub-slot configuration;  For the 7-symbol\*2 sub-slot configuration of NCP or the 6-symbol\*2 sub-slot configuration of ECP, the value of the maximum number of actual PUCCH transmissions for HARQ-ACK within a slot is {2}.  NOTE: If a UE reports both *multiPUCCH-r16* and *twoHARQ-ACK-Codebook-type1-r16*, it can support two slot-based HARQ-ACK codebooks, and one slot-based and one-sub-slot-based HARQ-ACK codebooks. If a UE reports *twoHARQ-ACK-Codebook-type1-r16* but does not report *multiPUCCH-r16*, it can only support two slot-based HARQ-ACK codebooks. | FS | No | N/A | N/A |
| --- | --- | --- | --- | --- |

**Q1.1 Do companies see a need to change TS38.306 for the above (i.e. “No” means ‘to go with Alt-1’)?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| Intel | No (not strong view) |  |
| Qualcomm Incorporated | Need clarification | The existing text is already confusing, in particular the part which says “when simultaneously configured”. The UE capabilities above are related to being configured for one sub-slot based codebook, and one slot based codebook. How can they be configured simultaneously with two slot based HARQ-ACK codebooks? |
| Ericsson | No (no strong view) | The mentioned parts could also be removed, but we are okay to follow the majority view to make it crystal clear. |
| Apple | No strong view | If current wording is to be kept, then atleast a better wording than " the capability for each HARQ-ACK codebook is subjected“ can be made, like the capability for each HARQ-ACK codebook is bounded by“ |
| ZTE | Need clarification | We agree with the observation 3 that  If keep the sentence in the place as it is, UE cannot report capability of supporting “one PUCCH format 0/2 + one PUCCH format 1/3/ 4”, or for “two format 0/2 PUCCH in non-consecutive symbols ” for slot+slot case, if the UE does not support 2\*7 symbol based subslot case. |
| vivo | No (No strong view) | We are fine to make some clarification on existing text, but not sure whether a new capability bit is needed. |
| MediaTek | No strong view | But better to clarify. |
| CATT | no strong view | As per R1 LS, it might be helpful to clarify a bit. |
| Samsung | No strong view |  |
| Huawei, HiSilicon | Need clarification | The current description is not appropriate based on the RAN1 understanding. |
| Nokia | No strong view | We should stick to alternative 1 (as it aligns with RAN1 agreement) and if necessary, we can simply add a note for clarification. |

**Q1.2 If yes, which alternative should we adopt (i.e. Alt-2, Alt-3 or others)?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Alt2/Alt3/Others** | **Comments** |
| Intel | No Alt2 | Alt-2 is already discussed in RAN1 and is thought not needed. Hence Alt2 should not be considered by RAN2. |
| Ericsson | Alt 3 | Alt-2 is ruled out by RAN1 |
| Apple | Alt 3 |  |
| ZTE | Alt 3 | Alt 3 can be taken as baseline |
| vivo | No Alt2 |  |
| MediaTek | Alt 3 |  |
| CATT | Alt 3 | To put the the clarification in one place is simpler. |
| Huawei, HiSilicon | Alt 3 | Alt 3 can be taken as baseline |
| Nokia | Alt 1 | Alt. 3 is a quite big rewriting, We don’t think RAN2 should do it without consulting with RAN1 first. |

**Q1.3 Do companies see a need to send a reply LS to RAN1 for confirmation regardless of the outcome?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| Ericsson | No | We don’t see a strict need, since it is clarfied in the LS that “RAN2 can consider editing sentences“. Additionally, the above highlight red colored sentences were introduced by RAN2, and so RAN2 can decide what to do with them. |
| Apple | No harm is replying back with what RAN2 has done… but no strong view either. |  |
| ZTE | No strong view |  |
| vivo | No | We think it is clear that RAN1 expects RAN2 to have some modification on the RAN2 related part as indicated in the LS. There may be no need to send back the reply LS. |
| MediaTek | No | Seems not needed |
| CATT | No strong view |  |
| Huawei, HiSilicon | Yes | It is safer to have RAN1 confirmation first then agree the CR in RAN2. |
| Nokia | Yes | Would be better to consult RAN1 if not Alt-1 |

***Rapporteur’s summary:***

*10 companies responded to the question Q1.1. 5 companies have no strong view on whether to clarify. 3 companies said no but do not have a strong view. And 3 companies think it needs clarification. In Q1.2, if it needs clarification, RAN2 should adopt Alt3 (i.e.* relocate the sentences all into *twoHARQ-ACK-Codebook-type1-r16*). *Alt2 (introduce new capabilities) is not to be supported as this is ruled out by RAN1. One company thinks Alt1 and other Alt requires RAN1 confirmation. In view that there are companies thinking that a clarification is needed and Alt3 seems to be the majority preference, it is proposed that:*

***Proposal#1\_1:*** *Agree to adopt Alt3 (i.e.* relocate the sentences all into *twoHARQ-ACK-Codebook-type1-r16 as baseline*). *The change will be included into the update of R2-2104884. Further detailed comments, if any, can be discussed in Phase 2 in the update of R2-2104884.*

*As on sending a LS, 3 companies do not think it is needed, 3 companies do not have a strong view with one thinking that there is no harm sending and 2 companies thinking there is a need. From the LS, RAN1 has left it to RAN2 to decide on whether the current places are appropriate for the sentences and if not, RAN2 can consider editing. Hence it is rapporteur understanding that there is no need for a reply LS. After further discussion, it is proposed to continue updating the spec but send a LS to RAN1 for confirmation as a compromise,*

***Proposal#1\_2****: Send a reply LS to RAN1 to confirm whether Alt3 (i.e.* relocate the sentences all into *twoHARQ-ACK-Codebook-type1-r16 as baseline*) *is ok with them.*

### 2.1.2 CRs based on updated R1 and R4 feature lists

The following CRs are related to the updated R1 and R4 feature lists (R1-2104120 and R4-2105854):

1. R2-2104884 Release-16 UE capabilities based on RAN1 and RAN4 feature lists Intel Corporation CR Rel-16 38.306 16.4.0 0573 - F NR\_eMIMO-Core, NR\_IIOT-Core, LTE\_NR\_DC\_CA\_enh-Core, NR\_L1enh\_URLLC-Core, NR\_HST-Core, TEI16
2. R2-2104885 Release-16 UE capabilities based on RAN1 and RAN4 feature lists Intel Corporation CR Rel-16 38.331 16.4.1 2585 - F NR\_eMIMO-Core, NR\_HST-Core, TEI16
3. R2-2105177 CR on the Updated RAN1/4 Features -38306 ZTE Corporation, Sanechips CR Rel-16 38.306 16.4.0 0579 - F TEI16
4. R2-2105178 CR on the Updated RAN1/4 Features -38331 ZTE Corporation, Sanechips CR Rel-16 38.331 16.4.1 2606 - F TEI16

The differences between (1)&(2) and (3)&(4) are as follow:

1. (1) also includes the following notes that RAN1 LS for the updated R1 feature list ask RAN2 to add to the field descriptions for 22-5c/5d:

“For simultaneously Ant.Sw . + Ant.Sw SRS in intra-band CA, or in inter-band CAs with bands whose UL are switched together according to the reported UE capability, the UE expects the same configuration of xTyR across the different CCs and the SRS resources overlapped in time domain from UE perspective are from the same UE antenna ports.”

1. (3) also includes the frequency class separation change as requested by R4 in a separate LS

In view that the CRs are intended for updated R1 and R4 feature lists, rapporteur tends to think that (1)&(2) are more aligned. There are also CRs related to update the frequency class separation and hence there is no need to treat this as part of the feature list upda2tes. Both have new HST capability added as well, but this can be decided whether to remove or update them based on the outcome of the HST discussion in Section 2.1.6.

**Q2.1 Do companies agree to the intention of the changes in (1)&(2) or (3)&(4)?**

|  |  |  |
| --- | --- | --- |
| **Company** | **(1)&(2) or (3)&(4)** | **Comments** |
| Intel | (1)&(2) | There is a separate discussion on frequency class separation in Section 2.1.8 |
| Qualcomm Incorporated | (1)&(2) | OK to discuss frequency separation class spearately. |
| Ericsson | (1)&(2) | Agree that frequency class should be discussed separetly. |
| Apple | (1)&(2) |  |
| ZTE | (1)&(2) or (3)&(4) | In (1)(2) It includes R1 and R4 feature lists updates  In (3)(4), it includes R1 and R4 feature lists together with RAN4’s LS on frequency class separation. |
| vivo | (1)&(2) | We are fine to have seperate discussion on frequency class. |
| MediaTek | (1)&(2) | For frequency separation class, we prefer to have separte CR. |
| CATT | (1)&(2) | frequency seperation class can be discussed seperately. |
| Samsung | (1)&(2) | OK to discuss frequency separation class spearately. |
| Huawei, HiSilicon | (1)&(2) | OK to discuss frequency separation class spearately. Besides, there is separate CR for HST capability. |

**Q2.2 For companies agreeing to the proposed changes in either (1)&(2) or (3)&(4), please also comment on the contents of the CRs, if any.**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| Intel | No to (1)&(2) | Proponent of (1)&(2) |
| Ericsson | (1)&(2) | The changes related to HST contains:  UE shall only indicate support of this feature only if measurementEnhancement-r16 is not reported.  This seems a bit confusing. As indicated by the rapporteur, this can be discussed in section 2.1.5 – where the CR in [10] provides a clearer wording. |
| Apple | (1)&(2) | Apple also has a CR for this in R2-2105094. Same comments as Ericsson on the wording. |
| ZTE |  | To (1)(2) modification on HST, it shall be finally determined based on the the discussion result on 2.1.5 |
| Huawei, HiSilicon | (1)&(2) | For HST capability, depends on the result on 2.1.5. |

***Rapporteur’s summary:***

*10 companies responded to the question Q2.1. All companies are ok going with (1)&(2) while 2 companies are also ok with (3)&(4). For (1)&(2), it is mentioned that the HST can be discussed separately with the CRs in Section 2.1.5.*

***Proposal#2:*** *Agree to pursue CRs in R2-2104884 (TS38.306 CR) and R2-2104885 (TS38.331 CR) for the R1 and R4 feature list update. Remove the HST capabilities in the CRs as it will be discussed separately. CRs in R2-2105177 (TS38.306 CR) and R2-2105178 (TS38.331 CR) are noted. Further detailed comments to the CR, if any, can be discussed in Phase 2.*

### 2.1.3 TX Diversity capability

In [6] and [7], it thinks that RAN2 can already introduced the Rel-16 capability with release independent for Rel-15 by including the CRs in the release independent table.

:

In RAN4#98e meeting, an LS on signalling scheme of transparent TxD was agreed and sent to RAN2 in R2-2102646. In RAN2#113bis-e meeting, the corresponding capability was discussion, and it was agreed that:

=> RAN2 to capture RAN4 conclusion to introduce a new per-band capability signaling for FR1 UEs supporting transparent TxD in Rel-16.

=> RAN2 can support Rel ind for R15, by early impl CR.

=> It is possible to only apply the change for PC2 UEs for R15 (possibly this may mean signalling of two ind FFS).

Thus, RAN2 should introduce the corresponding capability according to RAN4 and RAN2 conclusions.

As on [8], it is discussing the signalling design of the capability with the release independent depending on whether the release independent is for all power classes or just for PC2. If the release independent is applied to all power classes, then it is just adding the CRs to the release independent table in TS38.331. And if only PC2, 2 options are proposed

Since RAN2 has sent a LS on the following to RAN4, rapporteur wonders whether we should wait for RAN4 reply before discussing the CRs

* It is possible to only apply the change for this new capability for PC2 UEs for Rel-15, but RAN2 would like to understand whether the Rel-16 capability signalling applies for all PCs, while Rel-15 capability signalling applies for just PC2 (as this difference in Rel-15 and Rel-16 capability might impact the signalling design)?
* RAN2 would also like to confirm whether this new capability has any dependencies with other capabilities that should be captured by RAN2 (since the capability is intended as release independent, RAN2 may need to capture such pre-requisites explicitly).

**Q3.1 Do companies agree RAN2 should wait for the reply from RAN4 related to release independent and pre-requisites?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| Intel | Wait for RAN4 reply LS |  |
| Qualcomm Incorporated | Yes | Early implementation aspect should be sorted out together. |
| Ericsson | Wait for RAN4 reply LS |  |
| Apple | Yes |  |
| ZTE | Wait for RAN4 reply LS |  |
| Vivo (Proponent) | Wait for RAN4 | The corresponding discussion in RAN4 is on-going. We could implement this early implimentation after receiving response from RAN4. |
| MediaTek | Prefer wait for RAN4 |  |
| CATT | Wait for RAN4 |  |
| Samsung | Yes | Need to wait RAN4 |
| Huawei, HiSilicon | OK to wait for RAN4 reply LS |  |
| Nokia | Wait for RAN4 | We agree with Intel’s comments that we should wait which requires RAN4 input (which is currently ongoing). |

**Q3.2 If no, 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 (e.g. how to include restriction to the release independent to PC2 if it is RAN4 intention etc. e.g. based on [8]).**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

***Rapporteur’s summary:***

*11 companies responded to the Q3.1 and all agreed to wait for RAN 4 reply LS*

***Proposal#3:*** *Wait for RAN4 reply LS related to release independent and pre-requisites before pursuing the CRs for introducing the TX diversity capability in RAN2 spec.*

### 2.1.4 NR-u corrections

The CR R2-2105063 [9] has the following reason for change and the changes are to indicate that those capabilities are only for shared spectrum channel access:

:

In RAN1 feature list (R1-2102006), the following capabilities are only applies to shared spectrum channel access. However, in the field description of the corresponing capabilities, there lacks such restrictions.

For UE capability ***ssb-AndCSI-RS-RLM-r16***

|  |  |  |
| --- | --- | --- |
| 10-26e | RLM based on a mix of SS block and CSI-RS signals within active BWP for operation with shared spectrum channel access | RLM based on a mix of SS block and CSI-RS signals within active BWP for operation with shared spectrum channel access |

For UE capability ***pdsch-RepetitionMultiSlots-r16***

|  |  |  |
| --- | --- | --- |
| 10-40a | PDSCH repetitions over multiple slots for unlicensed spectrum | K = 2, 4, 8 times repetitions for unlicensed spectrum |

For UE capability ***sp-CSI-ReportPUSCH-r16***

|  |  |  |
| --- | --- | --- |
| 10-33a | Semi-persistent CSI report on PUSCH for unlicensed spectrum | Support semi-persistent CSI report on PUSCH for unlicensed spectrum |

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).

Since the changes are quite editorial and if agreed, it can be merged with the rapporteur miscellaneous correction CR (R2-2104887) if agreeable.

**Q4.1 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?**

|  |  |  |  |
| --- | --- | --- | --- |
| **Company** | **Yes/No** | **Merged with Rapp’s misc correction CRs** | **Comments** |
| Intel | Yes | Yes |  |
| Qualcomm Incorporated | Yes | Yes |  |
| Ericsson | Partly | Yes | The first change is not needed as the capability does not contain the magic sentence “This capability is also applicable to frequency band that does not require shared spectrum access“: |
| Lenovo | Yes | Yes | Minor editorial corrections since the applicability of the concerned capabilities is implied by ASN.1 (as they can be signalled only in IE SharedSpectrumChAccessParamsPerBand or  Phy-ParametersSharedSpectrumChAccess). |
| Apple | Yes | Yes |  |
| ZTE | Yes | Yes |  |
| vivo | Yes | Yes |  |
| MediaTek | Yes | Yes |  |
| CATT | Yes(as proponent) | Yes(as proponent) | @Ericsson: not sure if I get the point, but in our understanding the first and the rest of the changes are all for the similar reason.  We are ok to include these to Rapp’s misc CR if that is majority’s view. |
| Samsung | Yes | Yes |  |
| Huawei, HiSilicon | Yes | Yes |  |

***Rapporteur’s summary:***

*11 companies responded to the Q4.1 and all companies are ok with the CR except one think that the first change is not needed. But according to 10-26e, there is also ‘the signaling is per band but is only expected for a band where shared spectrum channel access must be used’. Hence, in rapporteur’s view, the first change is fine. All companies are ok with merging with the rapporteur’s CR. Hence it is proposed:*

***Proposal#4:*** *Agree to the changes in R2-2105063 which will be merged into the update of R2-2104887. Further detailed comments, if any, can be discussed in Phase 2 in email disc [020] on update of R2-2104887.*

### 2.1.5 New HST capabilities and configuration

In the R4 LS (R4-2105855), RAN4 asks RAN2 to include 2 new capabilities:

* 10-4) Support of intra-NR HST RRM measurement with speed up to 500km/h
* 10-5) Support of NR-LTE inter-RAT RRM measurement with speed up to 500km/h

[10] and [11] introduces the above capabilities. [11] also introduces new configurations corresponding to the new capabilities.

**Q5.1 Do companies agree to the proposed changes in the 306 CR and 331 CR? For companies agreeing to the proposed changes, please also comment on the contents of the CR, if any.**

|  |  |  |  |
| --- | --- | --- | --- |
| **Company** | **Agree to TS38.306 CR** | **Agree to TS38.331 CR** | **Comments** |
| Intel | Yes | Yes | With the split capability for intra-NR and inter-RAT EUTRAN measurement, the network should be able to indicate which configuration is expected on the UE. Hence we are fine with adding configuration IE in addition to the newly added capabilities |
| Qualcomm Incorporated | Yes | Yes |  |
| Ericsson | Yes (proponent) | Yes (proponent) |  |
| Lenovo | May need to be revised | May need to be revised | Shouldn’t the category of the CRs be cat B instead of cat F?  On the 38.331 CR:   * Not clear why IE HighSpeedParametersExt-r16 has been defined as CHOICE type. RAN4 feature list does not say that the UE is allowed to indicate only one capability and not both. * Furthermore, the new HST capabilities can be introduced as R16 NCE of highSpeedParameters-r16 instead of introducing new R16 field highSpeedParametersExt-r16. * In HighSpeedConfig field descriptions the suffices „-r16“ can be removed. |
| Apple | Yes(proponent) | Yes(proponent) | To Lenovo’s comments:  Since this is not a new feature, but rather a correction, 'F‘ reflects the category better?  Agree on the correction from CHOICE to SEQUENCE. Will have a revision.  For the comments on extending from highSpeedParameters-r16, it is not extensible as there is no extension marker…? Hope we are not missing anything. |
| ZTE | Yes | Yes |  |
| Vivo | Yes | Yes |  |
| MediaTek | Yes, but could meerge with Rapp’s CR | No, the control flag should (*HighSpeedConfig-r16)* not be changed | We don’t think new control Flag is requested by RAN4. It is unclear whether legacy UE that does not support this “in-capability” function has to support this new control flag.  We should not mandate UE that supports full HST RRM enhancement to update according to the new partial control flag. For UE that supports onlu partial funcionality, the old flag could be reused and the UE simply perform RRM based on its capability (which is known by NW). |
| CATT | Yes | Yes |  |

|  |  |  |  |
| --- | --- | --- | --- |
| Samsung | Yes | Yes |  |
| Huawei, HiSilicon | Yes | Yes for new capabiltiy  No for new configuration | We don’t think the new configuration is needed, the legacy configuration is enough. Based on the legacy configuration, the UE supports different requirement can have corresponding behavior which can be captured in RAN4. Besides, new configuration is not requested by the RAN4, if RAN2 prefers to introduce it, it should be confirmed by RAN4 first. |

***Rapporteur’s summary:***

*11 companies responded to the Q5.1. All companies are ok to pursue the TS38.306 CR. As on the TS38.331 CR, 9 companies are ok to pursue the TS38.331 CR with 1 company seeing a need of revision but 2 companies do not think the configuration flags are needed since they are not requested by RAN4. From the rapporteur’s point of view, in the case there is no new configuration flags (i.e. one for intra-NR measurement and one for NR-LTE inter-RAT measurement), the network will not be able to indicate/configure the UE which one is needed when the UE supports both even though only 1 is needed from the network point of view. Since it is not agreeable to all companies whether the configuration flag is needed, it would be good to check with RAN4 whether RAN2 needs to introduce configuration flag*

***Proposal#5:*** *Further discuss the need of the new configuration flags in Phase 2 for better understanding and whether to check with RAN4 whether such configuration flags are needed.*

*Q5.2 Do proponents and companies supporting configuration flags provide further justifications for introducing the configuration flags:*

*Q5.3 Do companies agree to check with RAN4*

### 2.1.6 Capability support of one-octet eLCID for IAB MT

In [12], it discusses whether the capability of supporting one-octet eLCID in IAB is optional or mandatory. 2 solutions are provided:

* Option A): this capability is mandatory, and the capability should be added in **TS 38.306** **4.2.15.1 Mandatory IAB-MT features**. This solution is given in the companion CR R2-2105360 [2].
* Option B): this capability is optional and should be added in **TS 38.306** **4.2.15.6 MAC Parameters**, support of the capability should be introduced in TS 38.331 ASN.1 code. Besides, further clarifications on the following parameters are also needed, where one should state that the IAB-MT must be capable of the one-octet eLCID functionality so that the corresponding feature can be well-supported (this solution is given in the companion CR R2-2105361 [3] and R2-2105362 [4]):
* *preEmptiveBSR-r16*
* *guardSymbolReportReception-IAB-r16*
* *t-DeltaReceptionSupport-IAB-r16*

In the last RAN2 meeting, based on the outcome of the discussion in R2-2104555, it is agreed to make the capability support of one-octet eLCID for UE to conditionally mandatory and the change is in R2-2104887 (in principled agreed CR). It is unclear to the rapporteur whether the same can also be applied to the support of one-octet eLCID for IAB MT?

* Option C): this capability of supporting one-octet eLCID in IAB is conditionally mandatory

Like in the CR R2-2104887, a new section in sub-section in 4.2.15 includes the table as follow:

| **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]. |

**Q6.1 Do companies agree with Option A) or B) or C)? Please also provide further comments on the changes proposed for Option A) or B) or C)**

|  |  |  |
| --- | --- | --- |
| **Company** | **Option A) or B) or C)** | **Comments** |
| Intel | Option C | The same understanding as normal UE can be applied for IAB-MT. No further change is needed for IAB MT (i.e. what is in R2-2104887 IPA CR also applied to IAB MT). |
| Qualcomm Incorporated | Option C | Agree with Intel. |
| Ericsson | Option C | We agree with Rapporteur. The issue was already resolved last meeting. |
| Lenovo | Option C | The agreement we made in last meeting is generic for all features which are required to support one-octet eLCID. |
| vivo | Option C, but... | We are fine with option C, but we think it is better to explicitly clarify that this capability is conditional present for IAB-MT, our concern comes from the statement in subclause 4.2.15 (IAB Parameters):  *All other feature groups or components of the feature groups as captured in TR 38.822 [24] as well as capabilities specified in this specification are optional for an IAB-MT, unless indicated otherwise.* |
| CATT | Option C | The agreement last meeting already coved the case of IAB. |

|  |  |  |
| --- | --- | --- |
| Samsung | Option A | We agree with Intel that this change has already been introduced for a “normal“ UE, where it is conditionally mandatory – a “normal“ UE needs to support eLCID if it supports any of the related MAC CEs.  However, in our understanding an IAB-MT has to unconditionally support certain MAC CEs from the one-octet eLCID space (e.g. Desired Guard Symbols MAC CE). |
| Huawei, HiSilicon | Option C | Agree with Intel. |
| ZTE | Option C, but | Agree with vivo that some clarification is needed that supporting of MAC subheaders with one-octet eLCID field is conditionally mandatory feature for IAB-MT. Otherwise, it would be regarded as optional based on current specification and the in principled agreed CR R2-2104887. |
|  |  |  |

***Rapporteur’s summary:***

*9 companies responded to the Q6.1. 8 companies are ok to go with Option C, but 2 companies think some updates is needed* *that supporting of MAC subheaders with one-octet eLCID field is conditionally mandatory feature also for IAB-MT. One company think Option A (i.e. mandatory for IAB-MT). It is rapporteur’s understanding that if a UE/IAB-MT needs to use a MAC CE that requires MAC subheaders with one-octet eLCID field, then it is mandatory to the UE on the condition that UE/IAB-MT needs to use the MAC CE. Based on the suggestion, it is proposed to update the text in R2-2104887:*

***Proposal#6:*** *Update the text in 4.2.15 of R2-2104887 as follow. Further detailed comments, if any, can be discussed in Phase 2 in email disc [020] on update of R2-2104887.*

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

### 2.1.7 New frequency separation class

RAN4 LS (R4-2104402) request RAN2 to introduce 2 new frequency separation class.

|  |
| --- |
| RAN4 has introduced two new frequency separation classes into Table 5.3A.4-2 in TS 38.101-2. Values in that table correspond to IE *FreqSeparationClass.* New values are 400 and 600 MHz. |

[16-18] propose to introduce new *intraBandFreqSeparationDL/UL-v16xy* (corresponds to new *FreqSeparationClassDL/UL-v16xy*) to include the new frequency separation classes 400 and 600 MHz. This option is the same as when *intraBandFreqSeparationDL/UL-v1620* is introduced. The difference is, as explained in [16], *FreqSeparationClassDL/UL-v1620* was introduced to include some new frequency separation classes but still allow the UE to set the Rel-15 *FreqSeparationClassDL/UL* so that the Rel-15 gNB can validate the field *intraBandFreqSeparationDL/UL* (without suffix) while UE can also provide *intraBandFreqSeparationDL/UL-v1620* for Rel-16 gNB. The reason this can be done is because the frequency separation classes introduced in *FreqSeparationClassDL/UL-v1620* are all larger than the ones in *FreqSeparationClassDL/UL*. However, the 2 new frequency separation classes (400MHz and 600MHz) introduced by RAN4 this time are all smaller than the ones in Rel-15 (i.e. *FreqSeparationClassDL/UL*). To introduce new *intraBandFreqSeparationDL/UL-v16xy* (corresponds to new *FreqSeparationClassDL/UL-v16xy*), [16] proposes the following constraints to be added to TS38.306 [17]:

**Proposal 1: If the UE sets the new field *intraBandFreqSeparationDL/UL-v16xy* with 400 MHz and 600 MHz, it shall not set *intraBandFreqSeparationDL/UL* (without suffix).**

**Proposal 2: The network ignores the intra-band non-contiguous CA band combination if the *intraBandFreqSeparationDL/UL* (with/without suffix) is not present.**

An alternative to include *intraBandFreqSeparationDL/UL-v16xy* (with corresponding new *FreqSeparationClassDL/UL-v16xy*) is to include the new frequency separation classes after the ellipsis as provided in CR 38.331 [19]:

From the above, there are 2 ways to introduce the new frequency separation class:

Option 1: Introduce a new NCE IE *intraBandFreqSeparationDL/UL-v16xy* with corresponding new *FreqSeparationClassDL/UL-v16xy* to include the new frequency separation class as follow (based on [18]:

DL:

FeatureSetDownlink-v16xy ::= SEQUENCE {

intraBandFreqSeparationDL-v16xy FreqSeparationClassDL-v16xy OPTIONAL

}

UL:

FeatureSetUplink-v16xy ::= SEQUENCE {

intraBandFreqSeparationUL-v16xy FreqSeparationClassUL-v16xy OPTIONAL

}

FreqSeparationClassDL-v16xy ::= ENUMERATED {mhz400, mhz600}

FreqSeparationClassUL-v16xy ::= ENUMERATED {mhz400, mhz600}

Option 2: Introduce the new frequency separation classes in *FreqSeparationClass* as follow (based on [19]:

FreqSeparationClass ::= ENUMERATED { mhz800, mhz1200, mhz1400, …, mhz400-v16xy, mhz600-v16xy}

**Q7.1 Do companies agree to introducing the new frequency separation classes using Option 1 [18] or Option 2 [19])?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| Intel | Option 2 | Option 2 is simpler and it seems to meet the requirement from RAN4 without the need to change the field description in TS38.306. |
| Qualcomm Incorporated | Option 2 (Proponent) |  |
| Ericsson | Option 2. | When we (Ericsson, Nokia and QC) wrote the CRs for option 2, we did consider option 1. We discarded that approach though. Because:  When we added earlier added the extension of, for example 1000 MHz, we used a NCE (v1620) because a UE should inidcate the "next lower value" in the legacy field. This would make sure a gNB not implementing the CR to still be able to serve the UE (even though not using the full capabilities of the UE w.r.t. freq separation classes).  But now, we add values which are smaller than any existing values, hence it is not possible to indicate a "next smaller value" in legacy signalling. Hence we can simply extend as per option 2. |
| Lenovo | Option 2 | Option 2 looks sufficient. |
| Apple | Op2 |  |
| ZTE |  | Both option 1 and 2 can be accepted to us |
| vivo | Option 2 | As there is restriction in current sepcification “If the UE sets the field *intraBandFreqSeparationDL-v1620* it shall set *intraBandFreqSeparationDL* (without suffix) to the nearest smaller value.“, it is better to follow this principle when making the extension. Otherwise, we need to add more restriction for each of the extension.  So option 2 is a better approach, and simper way. |
| MediaTek | Opiton 2 |  |
| CATT | Option 2 |  |

|  |  |  |
| --- | --- | --- |
| Samsung | ? | Changes are correct as in legacy field there is no nearest smaller value that UE can also signal.  Remaining question is whether to use extension marker (with its overhead), or new field as in Huawei CR in R2-2105717. If signaled frequently, Option 1 may be more efficient. |
| Huawei, HiSilicon | Option 1 (Proponent) | Both option 1 and 2 can be accepted to us. |

**Q7.2 For the option chosen, do companies see a need to update the corresponding field description in TS38.306 CR ? If yes,, please comment on the changes needed.**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| Intel | No | With Option 2, there is no need for Proposal 1 as suggested in [17]. Also, there is no need of Proposal 2 since the legacy network will know that UE has reported the *intraBandFreqSeparationDL/UL*(without suffix) with value that is not comprehensible . Anyway, we do not specify network behaviour. |
| Ericsson | No | As described in the inter-operability-wording in the CRs for Option 2:  *If the UE has implemented this change but the NW has not, the UE may signal the newly defined frequency separation values (400 and 600) but network not comprehending them will assume that this UE does not support intra-band non-contiguous CA according to this FeatureSet and will not configure UE to use the FeatureSet, so there are no inter-operability issues.*  Usually we dont capture this type of NW behaviour in the specification. |
| Apple | No |  |
| ZTE | No |  |
| vivo | No | We are fine to keep the inter-operability for option 2 as it is in coverpage. |
| MediaTek | No (if option 2 is adopted) |  |
| CATT | No | For option 2, the problem addressed by proposal 1 and 2 are not present. |
| Huawei, HiSilicon |  | We are fine to not update field description in TS38.306 CR, we would suggest to clarify the compatibility issue in the chairman’t note:  *The network ignores the intra-band non-contiguous CA band combination if the network cannot comprehend the frequency separation classe capability reported by the UE.* |

***Rapporteur’s summary:***

*11 companies responded to the Q7.1. 8 companies support going for Option 2. 1 company is ok with Option 1 and 2. One company supports Option 1 but ok to go with Option 2. One company think that Option 1 is more efficient. Also all companies except one do not think field description needs to be updated. One company suggest to clarify the compatibility issue in the chair’s notes while another company mentions that the interoperability issue anyway is provided in the cover page of the CR. In view that more companies support Option 2 and companies supporting Option 1 is also ok with Option 2:*

***Proposal#7:*** *Agree to pursue to CR in R2-2105247. Further detailed comments to the CR, if any, can be discussed in Phase 2.*

### 2.1.8 Corrections on TPMI grouping

The CR R2-2106315 [20] has the following reason for change:

:

The 38.306 NOTE 2 in the field description for *ul-FullPwrMode2-TPMIGroup-r16* needs some clarification.

NOTE 2: For 4 port partial-coherent or full-coherent UE, UE can report: 2-port {2-bit bitmap} and one of 4-port non-coherent {G0~G3} and one of 4-port partial-coherent {G0~G6}

For 4 port non-coherent UE, UE can report: 2-port {2-bit bitmap} and one of 4-port non-coherent {G0~G3}

For 2 port UE, UE can report: 2-port {2-bit bitmap}

1. For 4 port non-coherent UE, the note says that “UE can report: 2-port {2-bit bitmap} and one of 4-port non-coherent {G0~G3}.” Due to the text “the UE can report…” in the beginning, there could be the following misunderstanding.

* First, it is not clear from the text that the a non-coherent UE is not allowed to report 4-port partial-coherent {G0~G6}.
* Second, whether the UE can report 2-port {2-bit bitmap} only or one of 4-port non-coherent {G0~G3} only needs to be clarified.

1. The second misunderstanding above exists also for the 4 port partial-coherent UE.
2. Based on 38.331, *fourPortsNonCoherent-r16* and *fourPortspartialCoherent-r16* can indicate only one TPMI group from g0 through g6. However, their description in 38.306 implies that the UE indicates a set of multiple groups {g0-g3} for non-coherent and {g0-g6} for partial-coherent.
3. The 38.331 uses lowercase g0-g6 for the TPMI groups, but 38.306 uses uppercase G0-G6. For consistency, it should be aligned the capitalization.

**Q8.1 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?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| Intel | No | For Change #1 and #2, the Note 2 is as from the R1 feature list and we do not see a need to change any part of the Note 2. In fact, the modification of the note changes the meaning of the RAN 1 agreement. With the adding of ‘/or’, it creates the possibility that 4-port partial coherent UE can do full power with non-coherent TPMI, but it can’t do full power with partial coherent TPMI. The original text prevents this case. The added ‘only‘ is also confusing.  OK with the changes #3 and #4 in the reason for change. However, they are quite editorial and we do not see a need to make these changes via CR. If needed, it can be included in the misc CR R2-2104887. |
| Qualcomm Incorporated | No | Agree with Intel that we should react based on RAN1 input. |
| Ericsson |  | In general the changes seem not critical. For change #1 and #2, if we could converge on a wording we would be fine to capture it, a suggestion is:  NOTE 1:     When a full coherent UE operates in mode 2, it reports TPMIs the same as a partial-coherent UE.  NOTE 2:     For 4 port partial-coherent or full-coherent UE, UE can report: 2-port {2-bit bitmap} and/or one of 4-port non-coherent {G0~G3} and/or one of 4-port partial-coherent {G0~G6}  For 4 port non-coherent UE, UE can report: 2-port {2-bit bitmap} and/or one of 4-port non-coherent {G0~G3}, but not any of 4-port partial-coherent {G0~G6}  For change #3 and #4, fine to merge to another CR if companies see a need for the updates. |
|  |  |  |
| Apple | No | Same view as Intel |
| ZTE | No | Same view as Intel |
| vivo | No | Agree with Intel. |
| CATT | No | We tend to agree with above comments that these changes are not so critical and nothing seems to be broken. |
| Samsung | Yes | Please note that this CR was submitted to RAN1 in the last RAN1 meeting. RAN1 indicated that the final decision could be determined by RAN2.  If needed we need to check RAN1 for Change #1/#2 is correct (whether internally or officially). |
| Huawei, HiSilicon | No | Same view as Intel |
| Nokia | No | Agree with Intel, only #3 and #4 can be agreed and those are editorial |

***Rapporteur’s summary:***

*9 companies responded to the Q8.1. 8 companies do not think the CR is needed. One company think that the changes are not critical while one think that the CR is submitted to RAN 1 and RAN 1* *indicated that the final decision could be determined by RAN2. In rapporteur’s point of view, the change should be driven by RAN1 with an update to the R1 feature list or via a LS. In view of this and that majority companies do not see a CR is needed and the note is aligned with the current R1 feature list:*

***Proposal#8:*** *Agree* ***not*** *to pursue the CR in R2-2106315 on TPMI grouping corrections.*

### 2.1.9 Updated Rel-16 feature list

R2-2104890 [21] contains the Rel-16 UE feature from RAN1, RAN2 and RAN4. It incorporated the latest updated Ran1 feature list (R1-2104120) as well as the latest RAN4 feature list (R4-2105854).

It is rapporteur’s understanding that the CR will be updated further based on the outcome from this meeting.

**Q9 Do companies agree to the proposed changes in the CR?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| Intel | Yes (Proponent) |  |
| Qualcomm Incorporated | Yes |  |
| Ericsson | Yes | It is also our understanding that further (and final) updates would follow based on the outcome of this meeting. |
| Apple | Yes |  |
| ZTE | Yes |  |
| vivo | Yes |  |
| MediaTek | Yes |  |
| CATT | Yes |  |
| Samsung | Yes |  |
| Huawei, HiSilicon | Yes, but | Please see our comments in offline 020. |

**For companies agreeing to the proposed changes, please also comment on the contents of the CR, if any.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Company** | **Feature no.** | **Comment raised** | **Proposals** | **Rapporteur’s resolution** |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

***Rapporteur’s summary:***

*10 companies responded to the Q9. All companies agree to pursue the CR but it needs to take into comment in 020 and also any updates from this email discussion.*

***Proposal#9:*** *Agree to pursue to CR in R2-2104890. Need to take into account comments in email disc [020] and also any updates from this meeting. Further detailed comments to the CR, if any, can be discussed in Phase 2 in email disc [020].*

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

### 2.2.1 Leftover issue on 2 PUCCH capability

Outcome of Phase 1:

***Proposal#1\_1:*** *Agree to adopt Alt3 (i.e.* relocate the sentences all into *twoHARQ-ACK-Codebook-type1-r16 as baseline*). *The change will be included into the update of R2-2104884. Further detailed comments, if any, can be discussed in Phase 2 in the update of R2-2104884.*

***Proposal#1\_2****: Send a reply LS to RAN1 to confirm whether Alt3 (i.e.* relocate the sentences all into *twoHARQ-ACK-Codebook-type1-r16 as baseline*) *is ok with them.*

### 2.2.2 CRs based on updated R1 and R4 feature lists

Outcome of Phase 1:

***Proposal#2:*** *Agree to pursue CRs in R2-2104884 (TS38.306 CR) and R2-2104885 (TS38.331 CR) for the R1 and R4 feature list update. Remove the HST capabilities in the CRs as it will be discussed separately. CRs in R2-2105177 (TS38.306 CR) and R2-2105178 (TS38.331 CR) are noted. Further detailed comments to the CR, if any, can be discussed in Phase 2.*

### 2.2.3 TX Diversity capability

Outcome of Phase 1:

***Proposal#3:*** *Wait for RAN4 reply LS related to release independent and pre-requisites before pursuing the CRs for introducing the TX diversity capability in RAN2 spec.*

### 2.2.4 NR-u corrections

Outcome of Phase 1:

***Proposal#4:*** *Agree to the changes in R2-2105063 which will be merged into the update of R2-2104887. Further detailed comments, if any, can be discussed in Phase 2 in email disc [020] on update of R2-2104887.*

### 2.2.5 New HST capabilities and configuration

Outcome of Phase 1:

***Proposal#5:*** *Further discuss the need of the new configuration flags in Phase 2 for better understanding and whether to check with RAN4 whether such configuration flags are needed.*

***Q5.2 Do proponents and companies supporting configuration flags provide further justifications for introducing the configuration flags:***

|  |  |  |
| --- | --- | --- |
| **Company** | **Support configuration flags (Yes or No)** | **Justifications** |
| Rapporteur |  | *From the rapporteur’s point of view, in the case there is no new configuration flags (i.e. one for intra-NR measurement and one for NR-LTE inter-RAT measurement) and the existing control flag is used, the network will not be able to indicate/configure the UE which one is needed when the UE supports both even though only 1 is needed from the network point of view. However, it is not clear to rapporteur whether this is the reason to introduce new configuration flags. Hence this question.* |
| MediaTek | No | We have full functionality in capability 10-1 and two new capability (10-4 and 10-5) for **partial** function of 10-1. According to RAN4, the UE **shall NOT** indicate support of 10-4 or 10-5 if it supports 10-1. Then, in the NW side, it is unclear that whether this kind of UE has been updated to the new ASN.1 version so that it supports the partial control flag. There is potential IOT issue.  We actually don’t know the motivation to activate only partial function if the UE could do better RRM enhancement. It seems not RAN4 intention to have partial control for UE support full feature. |
| Apple | Yes | Two justifications are provided as follows:   1. As RAN4 LS indicated, the new capabilities need for the gNB to know. gNB should be able to enable the measurement enhancement via the configuration accordingly.   But the existing control flag is to enable both the inter-RAT and intra-RAT HST measurement enhancements, which cannot indicate UE to enable intra-RAT only or inter-RAT only measurement.   1. NR configuration should be in similar to what we already have for LTE in 36.331, i.e. using the seperate configurations for inter-RAT and intra-RAT cases:    * *highSpeedCarrierNR* is configured to enable the inter-RAT NR HST measurement enhancement;    * *highSpeedEnhMeasFlag2* is configured to enable the intra-RAT HST measurement enhancement. |
| Huawei, HiSilicon | No | From NW point of view, we doubt the necessity of this new configuration because it not clear how the NW use it. This configuration should be cell specific instead of UE specific, it is unclear if the NW sets or does not set this new configuration based on any one of the UE/all the UEs in the cell supporting such new requirement. The new capability may not help the determination of setting new configuration a lot . The policy of setting new configuration field may be the same as setting the legacy configuration field, so we understand using legacy configuration is enough. |
| Ericsson | Yes | Agree with Apple. |
| ZTE | No | Agree with MTK and HW.  From network perspecitve, we haven’t seen the need for enabling partial function when UE actually supports both. So the old configuration can be reused, and UE can apply measurement enhancement based on its own capabilitiy. E.g. if only intra-NR is supported, then UE only applies measurement enhancement for intra-NR measurements. |

***Q5.3 Do companies agree to check with RAN4?***

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| Rapporteur |  | *Since it is not agreeable to all companies whether the configuration flags are needed and one company suggests to check with RAN4, hence rapporteur also set this question* |
| MediaTek | See comment | Yes if we really have no consensus on this. But if possible , we prefer to solve this in RAN2. |
| Apple |  | If companies have concern on the new configuration flags, it’s better to send LS to RAN4 and check their view. |
| Huawei, HiSilicon |  | If no consensus on this issue in RAN2, it would be better to check with RAN4. |
| ZTE |  | We understand this was discussed in RAN4 and no consensus was reached, thus RAN4 LS did not mention the necessity of new configuration.  But we would be fine if majority companies want to send another LS for further checking. |

***Rapporteur’s summary:***

*4 companies participated in the Phase 2 discussion. After discussing offline among the 4 companies, there are 2 way forward:*

1. If companies agree that “it is not the RAN4 intention to have partial control for UE support full feature”, just need to update the field description of the existing control flag to describe the dependency to the 2 new capabilities (e.g. HST Intra NR RRM measurement is enabled if HST intra NR RRM capability is reported etc.)
2. If some companies think that partial control for UE supporting full feature is needed but others don’t, then it may be beneficial to check with RAN4 via a LS whether they see any benefit of partial control for UE supporting full feature. However this will mean that the introduction of the new HST capabilities will have to be postponed as I assume the new capabilities will be used to indicate whether the UE support partial control.

| ***HighSpeedConfig* field descriptions** |
| --- |
| ***highSpeedMeasFlag-r16***  If the field is present and UE supports*measurementEnhancement-r16*, the UE shall apply the enhanced intra-NR and inter-RAT EUTRAN RRM requirements to support high speed up to 500 km/h as specified in TS 38.133 [14].   If the field is present and UE supports *intraNR-MeasurementEnhancement-r16*, the UE shall apply enhanced intra-NR measurement requirements to support high speed up to 500 km/h as specified in TS 38.133 [14].  If the field is present and UE supports *interRAT-MeasurementEnhancement-r16*, the UE shall apply enhanced inter-RAT EUTRAN measurement requirements to support high speed up to 500 km/h as specified in TS 38.133 [14]. |

*The main concern it seems is that UE will be indicate with the existing configuration flag even if it is only supporting enhanced intra-NR or inter-RAT EUTRAN measurement for HST. It seems like 1) is acceptable to the proponents and also other that do not see a need of the new configurations. Hence it is proposed that only field descriptions of the existing configuration flag is updated as follow:*

***Proposal#5(new):*** *Agree to pursue the CRs (R2-2105094 (38.306 CR) and R2-2105095 (38.331 CR) with the following updates. Further detailed comments to the CR, if any, can be discussed in Phase 2*

* *No new configuration flags*
* *Update the field description as follow:*

| ***HighSpeedConfig* field descriptions** |
| --- |
| ***highSpeedMeasFlag-r16***  If the field is present and UE supports*measurementEnhancement-r16*, the UE shall apply the enhanced intra-NR and inter-RAT EUTRAN RRM requirements to support high speed up to 500 km/h as specified in TS 38.133 [14].   If the field is present and UE supports *intraNR-MeasurementEnhancement-r16*, the UE shall apply enhanced intra-NR measurement requirements to support high speed up to 500 km/h as specified in TS 38.133 [14].  If the field is present and UE supports *interRAT-MeasurementEnhancement-r16*, the UE shall apply enhanced inter-RAT EUTRAN measurement requirements to support high speed up to 500 km/h as specified in TS 38.133 [14]. |

### 2.2.6 Capability support of one-octet eLCID for IAB MT

Outcome of Phase 1:

***Proposal#6:*** *Update the text in 4.2.15 of R2-2104887 as follow. Further detailed comments, if any, can be discussed in Phase 2 in email disc [020] on update of R2-2104887.*

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

### 2.2.7 New frequency separation class

Outcome of Phase 1:

***Proposal#7:*** *Agree to pursue to CR in R2-2105247 (Option 2). Further detailed comments to the CR, if any, can be discussed in Phase 2.*

### 2.2.8 Corrections on TPMI grouping

Outcome of Phase 1:

***Proposal#8:*** *Agree* ***not*** *to pursue the CR in R2-2106315 on TPMI grouping corrections.*

### 2.2.9 Updated Rel-16 feature list

Outcome of Phase 1:

***Proposal#9:*** *Agree to pursue to CR in R2-2104890. Need to take into account comments in email disc [020] and also any updates from this meeting. Further detailed comments to the CR, if any, can be discussed in Phase 2 in email disc [020].*

# 3 Outcome of Phase 2

Updated R1 and R4 feature list CRs

Proposal A: xxx

New Frequency separation class CR

Proposal B: xxx

New HST capabilities CR

Proposal C: xxx