**3GPP TSG-RAN WG2 Meeting #113-e R2-210xxxx**

**Online, January 25th – February 5th 2021**

**Agenda Item: 8.17**

**Source: Huawei, HiSilicon**

**Title: Summary of [AT113-e][034][NR17 Other] NR17 other (Huawei)**

**Document for: Discussion and decision**

# Introduction

This document summarizes the following offline discussion.

* [AT113-e][034][NR17 Other] NR17 other (Huawei)

Scope: Treat R2-2100054, R2-2100896, R2-2100897, R2-2100950, R2-2100951, T2-2100952, R2-2100953, R2-21002259, R2-21001457, R2-21001458, R2-2100046, R2-2101415, R2-2100055, R2-21001612, R2-21001613

Phase 1, determine agreeable parts, Phase 2, for agreeable parts Work on CRs and LS out if applicable.

Intended outcome: Report, Agreed CRs, approved LS if any is agreeable.

Deadline: Prepare such that results can be available Feb 3 (for potential CB Feb 4).

# Contact from companies

|  |  |
| --- | --- |
| Company | Email |
| Huawei, HiSilicon | Yiru Kuang (kuangyiru@huawei.com) |
| Nokia | Benoist Sébire (benoist.sebire@nokia.com) |
| Ericsson | lian.araujo@ericsson.com |
| T-Mobile USA | John.Humbert2@T-Mobile.com |
| Samsung | Sangyeob Jung (sy0123.jung@samsung.com) |
| Apple | naveen.palle@apple.com |
| Lenovo | hchoi5@lenovo.com |
| Intel | Youn.hyoung.heo@intel.com |
| SoftBank | katsunari.uemura@g.softbank.co.jp |
| ZTE | [li.wenting@zte.com.cn](mailto:li.wenting@zte.com.cn) |
| CATT | erlin.zeng@catt.cn |

# Discussion

## FR2 FWA power class

FR2 FWA - Power Class Release Indep R15

[R2-2100054](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_113-e\Docs\R2-2100054.zip) LS for FR2 FWA power class (R4-2016876; contact: Softbank) RAN4 LS in Rel-17 NR\_FR2\_FWA\_Bn257\_Bn258 To:RAN2

[R2-2100896](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_113-e\Docs\R2-2100896.zip) Introducing UE capability for power class 5 for FR2 FWA SoftBank, Huawei draftCR Rel-17 38.331 16.3.1 C NR\_FR2\_FWA\_Bn257\_Bn258-Core

[R2-2100897](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_113-e\Docs\R2-2100897.zip) Introducing UE capability for power class 5 for FR2 FWA SoftBank, Huawei draftCR Rel-17 38.306 16.3.0 C NR\_FR2\_FWA\_Bn257\_Bn258-Core

[R2-2100950](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_113-e\Docs\R2-2100950.zip) Introduction of PC5 for FR2 Nokia, Nokia Shanghai Bell CR Rel-15 38.331 15.12.0 2368 - B NR\_FR2\_FWA\_Bn257\_Bn258-Core

[R2-2100951](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_113-e\Docs\R2-2100951.zip) Introduction of PC5 for FR2 Nokia, Nokia Shanghai Bell CR Rel-16 38.331 16.3.0 2369 - A NR\_FR2\_FWA\_Bn257\_Bn258-Core

[R2-2100952](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_113-e\Docs\R2-2100952.zip) Introduction of PC5 for FR2 Nokia, Nokia Shanghai Bell CR Rel-15 38.306 15.12.0 0495 - B NR\_FR2\_FWA\_Bn257\_Bn258-Core

[R2-2100953](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_113-e\Docs\R2-2100953.zip) Introduction of PC5 for FR2 Nokia, Nokia Shanghai Bell CR Rel-16 38.306 16.3.0 0496 - A NR\_FR2\_FWA\_Bn257\_Bn258-Core

There are two options for introducing power class 5:

1. The power class 5 is introduced from Rel-17 with “Early implementation of this CR by Rel-15/16 UEs does not cause any inter-operability issues” in the cover sheet. (CRs R2-2100896/R2-2100897)
2. The power class 5 is introduced from Rel-15. (CRs R2-2100950~R2-2100953)

**Q1-1 Which option listed in above do companies support?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Option** | **Comments** |
| Huawei, HiSilicon | (1) | A new power class 1.5 was introduced in Rel-16, it was added as an Rel-16 signalling with stating “implementation of the change from Rel-15” in the cover sheet of the CR. For this new power class 5, we understand the same operation can be applied, and it will be clearer. |
| Nokia | 2 | This was also what RAN4 indicated in the LS, i.e. " In RAN4#97-e meeting, RAN4 agreed to choose Option2, a new power class (power class 5 ) is defined with release independent from release 15". |
| Ericsson | (1), but | We understand this question is mainly from the signalling point of view on how to introduce such power class, hence the discussion seems to be about 38.331. For 38.331, we do not have a strong view, both can actually work, but slightly prefer (1). For 38.306, the simple change in R2-2100953 seems sufficient (marked as option (2) above). |
| Samsung | (1) | We are fine to go with Option 1 |
| Apple | 1 | Opt 1 is better since this is new signalling. |
| Lenovo | (1) | The same approach as for PC 1.5 can be applied. |
| Intel | (1) | We agree that both approaches are working to introduce new power class and approach 1 seems more practical unless there is strong motivation to go with Rel-15 CR which we have not seen yet. |
| SoftBank | 1 | Proponent. It is the same approach as for PC1.5. |
| ZTE | (1) | We share the similar view with Intel that Rel17 plus magic sentence is preferred, unless there is strong motivation to go with Rel-15 CR which we have not seen yet. |
| Qualcomm | (1) | It is fine to follow PC1.5 approach |
| CATT | 1 | Ok to go with Opt.1. |

**Q1-2 If the option (1) is selected, do companies agree the CRs R2-2100896/R2-2100897? Please companies provide your comments on the CRs if any.**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| Huawei, HiSilicon | Yes, but | We agree with the signalling change in 38.331, however we have some concerns on the inter-operability issue, if the new UE reports the new field PC5 but the legacy cannot understand it, which power class should be applied? |
| Nokia | No | If we go with Rel-17 CR, it cannot be agreed now as we have no Rel-17 specifications. We can endorse the CR but it needs to be re-submitted once the Rel-17 specifications are available.  **38.331 CR:** On the CR cover page, normally we don't have inter-operability analysis for Cat C CRs unless they are done for legacy releases.  **38.306 CR:** The added sentence seems to be duplicating text from 38.101-2: Is there a reason why the current FR2 text (which already does refer to 38.101-2) is not sufficient here? Anyway UE should set both the new and the old fields according to 38.101-2 requirements for legacy node compatibility. |
| Ericsson |  | Agree with the intention of 38.331 – but as Nokia suggested, one would probably have to at most endorse them for now. For the updates to 38.306, we may need to further discuss it, but we think the CR on R2-2100953 is the baseline until we find that any additional change is really needed. |
| Samsung | Yes but | This should also be listed in the Annex C (i.e. List of CRs Containing Early Implementable Features and Corrections). |
| Apple | Not yet | Same view as Nokia |
| Intel |  | Agree with other companies. |
| SoftBank | Yes | OK to endorse the CRs for now, anyway it will need for corresponding RAN4 WI completion. We will resubmit update CRs after Rel-17 CR are available.  For inter-operability issue, as a legacy gNB may not expect in absent of FR2 power class value, UE supporting PC5 has to set both old and new values for a backward compatibility. In my understanding, 38.101-2 does not indicate how to signal them, so the clarification is needed in 38.306. |
| ZTE |  | Same view as Nokia |
| Qualcomm | Yes | Agree with Nokia regarding endorsing Rel-17 CR |
| CATT |  | Agree with most of the comments above |

**Q1-3 If the option (2) is selected, do companies agree the CRs R2-2100950~R2-2100953? Please companies provide your comments on the CRs if any.**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| Nokia | Yes | Proponent. |
| Ericsson |  | As said above, for 38.306, a simple change as R2-2100953 is preferred as baseline. We can then further discuss whether there is anything on top that we need to clarify later. |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

11 companies joined the discussion, 10 companies support the power class 5 is introduced from Rel-17 with magic sentence in the cover sheet, 1 company supports the power class 5 is introduced from Rel-15. Several companies mentioned that it cannot be agreed now as we have no Rel-17 specifications, the CRs should be endorsed. Several companies provided the comments on the contents of CRs including the wording for 38.306 CR, inter-operability analysis and Annex C (i.e. List of CRs Containing Early Implementable Features and Corrections).

**Proposal 1: The power class 5 is introduced from Rel-17 with magic sentence in the cover sheet. The CRs are pursued aiming to be agreed in principle, with considering the comments on wording for 38.306 CR, inter-operability analysis and Annex C.**

## 35 and 45 MHz channel Bandwidths

FR1\_35MHz\_45MHz\_BW - Release Indep R15

All Moved from 5.4.3:

[R2-2102259](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_113-e\Docs\R2-2102259.zip) LS to RAN2 on 35 and 45 MHz channel Bandwidths (R4-2017846; contact: T-Mobile) RAN4 LS in Rel-15 NR\_FR1\_35MHz\_45MHz\_BW-Core To:RAN2

[R2-2101457](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_113-e\Docs\R2-2101457.zip) Support of 35 MHz and 45 MHz channel bandwidth for FR1 Apple Inc, T-Mobile CR Rel-15 38.306 15.12.0 0511 - F NR\_FR1\_35MHz\_45MHz\_BW-Core

[R2-2101458](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_113-e\Docs\R2-2101458.zip) Support of 35 MHz and 45 MHz channel bandwidth for FR1 Apple Inc, T-Mobile CR Rel-16 38.306 16.3.0 0512 - A NR\_FR1\_35MHz\_45MHz\_BW-Core

The changes in the CRs are given as below:

|  |
| --- |
| ***channelBWs-DL***  Indicates for each subcarrier spacing the UE supported channel bandwidths. Absence of the *channelBWs-DL* (without suffix) for a band or absence of specific scs-XXkHz entry for a supported subcarrier spacing means that the UE supports the channel bandwidths among [5, 10, 15, 20, 25, 30, 40, 50, 60, 80, 100] and [50, 100, 200] that were defined in clause 5.3.5 of TS 38.101-1 version 15.7.0 [2] and TS 38.101-2 version 15.7.0 [3] for the given band or the specific SCS entry.  For FR1, the bits in *channelBWs-DL* (without suffix) starting from the leading / leftmost bit indicate 5, 10, 15, 20, 25, 30, 40, 50, 60 and 80MHz. For FR2, the bits in *channelBWs-DL* (without suffix) starting from the leading / leftmost bit indicate 50, 100 and 200MHz. The third / rightmost bit (for 200MHz) shall be set to 1.  For FR1, the leading/leftmost bit in *channelBWs-DL-v1590* indicates 70MHz, the second leftmost bit indicates 45MHz, the third leftmost bit indicates 35MHz and all the remaining bits in *channelBWs-DL-v1590* shall be set to 0.  NOTE: To determine whether the UE supports a specific SCS for a given band, the network validates the *supportedSubCarrierSpacingDL* and the *scs-60kHz*. To determine whether the UE supports a channel bandwidth of 90 MHz, the network may ignore this capability for and validate instead the *channelBW-90mhz* and the *supportedBandwidthCombinationSet*. For serving cells with other channel bandwidths the network validates the *channelBWs-DL*, the *supportedBandwidthCombinationSet*, the *asymmetricBandwidthCombinationSet* (for a band supporting asymmetric channel bandwidth as defined in clause 5.3.6 of TS 38.101-1 [2]) and *supportedBandwidthDL*. For each of the channel bandwidths indicated in *channelBWs-DL-v1590,* for the network to use the relevant *FeatureSetDownlinkPerCC*, the UE shall include at least one *FeatureSetDownlinkPerCC* with *supportedBandwidthDL* where the supported bandwidth value is greater than the channel bandwidth indicated in *channelBWs-DL-v1590*. |
| ***channelBWs-UL***  Indicates for each subcarrier spacing the UE supported channel bandwidths.  Absence of the *channelBWs-UL* (without suffix) for a band or absence of specific scs-XXkHz entry for a supported subcarrier spacing means that the UE supports the channel bandwidths among [5, 10, 15, 20, 25, 30, 40, 50, 60, 80, 100] and [50, 100, 200] that were defined in clause 5.3.5 of TS 38.101-1 version 15.7.0 [2] and TS 38.101-2 version 15.7.0 [3] for the given band or the specific SCS entry.  For FR1, the bits in *channelBWs-UL* (without suffix) starting from the leading / leftmost bit indicate 5, 10, 15, 20, 25, 30, 40, 50, 60 and 80MHz. For FR2, the bits in *channelBWs-UL* (without suffix) starting from the leading / leftmost bit indicate 50, 100 and 200MHz. The third / rightmost bit (for 200MHz) shall be set to 1.  For FR1, the leading/leftmost bit in *channelBWs-UL-v1590* indicates 70 MHz, the second leftmost bit indicates 45MHz, the third leftmost bit indicates 35MHz and all the remaining bits in *channelBWs-UL-v1590* shall be set to 0.  NOTE: To determine whether the UE supports a specific SCS for a given band, the network validates the *supportedSubCarrierSpacingUL* and the *scs-60kHz*. To determine whether the UE supports a channel bandwidth of 90 MHz the network may ignore this capability for and validate instead the *channelBW-90mhz* and the *supportedBandwidthCombinationSet*. For serving cells with other channel bandwidths the network validates the *channelBWs-UL*, the *supportedBandwidthCombinationSet*, the *asymmetricBandwidthCombinationSet* (for a band supporting asymmetric channel bandwidth as defined in clause 5.3.6 of TS 38.101-1 [2]) and *supportedBandwidthUL*. . For each of the channel bandwidths indicated in *channelBWs-UL-v1590,* for the network to use the relevant *FeatureSetUplinkPerCC*, the UE shall include at least one *FeatureSetUplinkPerCC* with *supportedBandwidthUL* where the supported bandwidth value is greater than the channel bandwidth indicated in *channelBWs-UL-v1590*. |

**Q2-1 Do companies agree the CRs R2-2101457/R2-2101458? Please companies provide your comments on the CRs if any.**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| Huawei, HiSilicon | Yes, but | We are fine with the first change, but not sure about the second change for NOTE, why we need such restrict for per CC BW and per band BW? |
| Nokia | Not as such | Intention is fine but "*value is greater than the channel bandwidth indicated in channelBWs-DL-v1590*" seems not correct formulation as this already contains a value of 70 MHz, so a UE will be mandated to report something that is larger than each of the ones in this field. |
| Ericsson | Yes, but | We are also fine with the first change.  We assume the added text in the NOTE is supposed to specify in more detail what is already covered by the sentence before.  So not essential but looks as a good clarification, this is pretty complex.  Should be “…greater than or equal to…”? Are the words “…for the network to use the relevant  FeatureSetUplinkPerCC…” needed? Those can be deleted. |
| T-Mobile USA | Yes | The clarification on max supported BW is needed, this clarifies the case when the maximum channel BW supported by a band is increased. |
| Samsung | Yes but | We share the view with Huawei that the change in NOTE seems not needed. |
| Apple | Yes (proponent) | Without the note, the NW does not know which featureSetPerCC to use when configuring the UE with any of the v1590 BWs. The UE only says support of new BWs, but featureSetPerCC does not have a BW enumerated that matches v1590. 70MHz is a slight exception where the featureSetPerCC has a Boolean for 70 MHz, but even here the BW parameter does not have an enumerated 70 MHz value to go with SCS/MCS… So with NOTE, the UE is expected to have atleast one featureSetPerCC with higher BW than v1590 that the NW can use. We already agreed that support of a particular BW implies support of lower BWs (except of the special ones from v1590 which need explicit signalling). |
| Lenovo | Yes | Cover page needs to be updated:   * The referenced RAN4 LS# R4-2017814 needs to be corrected to the approved one in R4-2017846. * The inter-operability statements should be elaborated a bit more, something like:   *1. If the network is implemented according to the CR and the UE is not, there are no inter-operability issues as the UE will not indicate the new channel bandwidths.*  *2. If the UE is implemented according to the CR and the network is not, there are no inter-operability issues as the network will ignore the new channel bandwidths.* |
| Intel | Yes but | Regarding the NOTE, it seems that the proposed change in the NOTE is the outcome of the previous sentence in the same NOTE. That is, since the network will consider both supportedBandwidthUL and channelBWs-DL, the UE should report the supportedBandwidhtDL that is at least greater than the channel bandwidth in channelBWs-DL-v1590.  There is no 35, 45, 70 MHz in supportBandwidthDL. So, only “greater than” should be ok. If our understanding correct, the clarification may not be so essential given that the existing sentence can cover but we are open to get other companies’ view. |
| ZTE | No | The 35M/45M is quite different from 70M.  According to the Table 5.3.5-1 Channel bandwidths for each NR band of 38101-1, we can see that the 70M was supported by band n77/n78, for these 2 bands, the possible maximum bandwidth could be 100M    Thus when discussing how to add 70M, companies think that if 70M was supported, the UE must support 80M, that is why the 70M was only included in the channelBWs-DL/UL.  Then back to 35M/45M, the maximum possible bandwidth, the possible maximum bandwidth will be extended from 40M to 45M for the band 3/25/40/66,and from 20M /25M to 35M for the band 8/71.    If take the CR, it means that if want to adopt the bandwidth 35M for the band 8/71 , the UE has to report 50M in the supportedBandwidth, however the 50M is even not in the 38101-1 Table 5.3.5-1 for the band 8/71. (The same problem exists for the band 3/25/40/66). That why in the LS RAN4 strength that  “RAN4 would like to point out that for some of the bands that 35 or 45 MHz will be applied to, 35 or 45 MHz will be the widest channel bandwidth for the band, in case that is of any significance to RAN2.”  So our understanding is that for the 35M/45M, it better to discuss whether the modification to the supportedBandwidth is needed first before any agreed CR. | | |
| Qualcomm | Yes | Also fine not to have the change in the Note which may create more confusion. | |
| CATT | Yes | Agree with the 1st change, note part seems not needed. | |

11 companies joined the discussion, 9 companies agree with the first change of the CRs but some companies have concerns on the proposed changes for NOTE, 2 companies does not agree with the CRs and the concern mainly comes from the proposed changes for NOTE. Thus, the intention of the CRs is agreeable. The first change of the CRs are pursued, continue to discuss the proposed changes for NOTE in Phase 2.

**Proposal 2: The first change of the CRs are pursued with considering the comments from Lenovo, continue to discuss the proposed changes for NOTE in Phase 2.**

Based on the above discussion, companies are invited to provide the feedback for the following questions.

**Q2-2 Do companies agree the proposed changes for NOTE is needed? If yes, please companies provide your comments on the wording if any.**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| Apple | Yes, but we are open to listen to other companies views | First we thank the rapporteur for re-triggering this in phase-2 to get a clarification.  We do see that some companies are ok with no clarification, and ZTE also mentioned that in some bands, 35 or 45 is the maximum BW of the channel.  Is the assumption then that the NW can use any of the featureSetDLPerCC entries for the bands where the UE supports 35 or 45MHz BW, even when the BW in these featureSetDLPerCC can have any value (for eg: 20 MHz)? Usually the UE might report higher capabilities with lower BW.  Or is the assumption that the UE will only include featureSetDLPerCC entries for the bands where the UE supports 35 or 45MHz BW, such that the BW are greater than (35 or 45 that the UE supports). This will be restriction to the UE.  Or is the assumption that the NW will only use the featureSetDLPerCC entries for the bands where the UE supports 35 or 45MHz BW, where the BW entry is greater than the UE signalled support of 35 or 45: this is intention of the note, where we require the UE to signal atleast one featureSetDLPerCC entry and require the NW to use this entry.  Pls note all of the above are applicable to UL as well.  We are open to get companies views and can submit a draft CR based on the outcome of this. |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

## UL MIMO restrictions for SUL

FR1 enh - UL MIMO restrictions for SUL

[R2-2100055](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_113-e\Docs\R2-2100055.zip) LS on removing restriction on configuring UL MIMO for SUL band (R4-2016909; contact: CMCC) RAN4 LS in Rel-17 NR\_RF\_FR1\_enh-Core To:RAN2 Cc:RAN1

[R2-2101612](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_113-e\Docs\R2-2101612.zip) Draft CR: Remove the maximum number of MIMO layers configuration restrictions for SUL CMCC, Huawei, HiSilicon, CATT draftCR Rel-17 38.331 16.3.1 B NR\_RF\_FR1\_enh

[R2-2101613](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_113-e\Docs\R2-2101613.zip) Draft CR: Remove the maximum number of MIMO layers restrictions for SUL CMCC, Huawei, HiSilicon, CATT draftCR Rel-17 38.306 16.3.0 B NR\_RF\_FR1\_enh

The changes in the 38.331 CRs are given as below:

|  |
| --- |
| ***maxMIMO-Layers***  Indicates the maximum MIMO layer to be used for PUSCH in all BWPs of the normal UL of this serving cell (see TS 38.212 [17], clause 5.4.2.1). If present, the network sets *maxRank* to the same value. The field *maxMIMO-Layers* refers to DCI format 0\_1. |
| ***maxMIMO-LayersForDCI-Format0-2***  Indicates the maximum MIMO layer to be used for PUSCH for DCI format 0\_2 in all BWPs of the normal UL of this serving cell (see TS 38.212 [17], clause 5.4.2.1). If present, the network sets *maxRankForDCI-Format0-2* to the same value. |

The changes in the 38.306 CRs are given as below:

| ***maxNumberMIMO-LayersCB-PUSCH***  Defines supported maximum number of MIMO layers at the UE for PUSCH transmission with codebook precoding. UE indicating support of this feature shall also indicate support of PUSCH codebook coherency subset. | FSPC | No | N/A | N/A |
| --- | --- | --- | --- | --- |
| ***maxNumberMIMO-LayersNonCB-PUSCH***  Defines supported maximum number of MIMO layers at the UE for PUSCH transmission using non-codebook precoding.  UE supporting non-codebook based PUSCH transmission shall indicate support of *maxNumberMIMO-LayersNonCB-PUSCH, maxNumberSRS-ResourcePerSet* and *maxNumberSimultaneousSRS-ResourceTx* together. | FSPC | No | N/A | N/A |
| ***maxNumberSimultaneousSRS-ResourceTx***  Defines the maximum number of simultaneous transmitted SRS resources at one symbol for non-codebook based transmission to the UE. | FSPC | No | N/A | N/A |
| ***maxNumberSRS-ResourcePerSet***  Defines the maximum number of SRS resources per SRS resource set configured for codebook or non-codebook based transmission to the UE. | FSPC | No | N/A | N/A |

**Q3-1 Do companies agree the CRs R2-2101612/R2-2101613? Please companies provide your comments on the CRs if any.**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| Huawei, HiSilicon | Yes |  |
| Nokia | Yes but | We cannot agree to Rel-17 CRs now - they can only be endorsed. Otherwise these seem OK for now.  However, we assume there may be need to be further update the capability descriptions once RAN4 decides on capabilities for SUL with MIMO. |
| Samsung | Yes with comments | Regarding the changes in the 38.331 CR, we think the following changes are also needed to apply UL MIMO configuration on normal UL and SUL of the serving cell independently.  ***maxMIMO-Layers***  Indicates the maximum MIMO layer to be used for PUSCH in all BWPs of the ~~normal~~ corresponding UL of this serving cell (see TS 38.212 [17], clause 5.4.2.1). If present, the network sets *maxRank* to the same value  ***maxMIMO-LayersForDCI-Format0-2***  Indicates the maximum MIMO layer to be used for PUSCH for DCI format 0\_2 in all BWPs of the ~~normal~~ corresponding UL of this serving cell (see TS 38.212 [17], clause 5.4.2.1). |
| Ericsson | Yes | Just some question for clarification regarding Rel-15. For Rel-15 is the UE supposed to omit completely the fields maxNumberMIMO-LayersCB-PUSCH/maxNumberMIMO-LayersNonCB-PUSCH? Maybe not, otherwise the UE could not indicate that it supports only e.g. maxNumberMIMO-LayersNonCB-PUSCH with 1 layer but no maxNumberMIMO-LayersCB-PUSCH. So for Rel-15, even though the value of 1 layer is always considered, the UE should report this 1 layer within the fields maxNumberMIMO-LayersCB-PUSCH and/or maxNumberMIMO-LayersNonCB-PUSCH, is that correct understanding? |
| Apple | Agree but | Same views as Huawei and Samsung. We also agree with Ericsson’s interpretation. |
| Intel | Yes but | Agree with Samsung’s change. Regarding Ericsson’s question, our understanding is that the UE omit the fields for SUL band in Rel-15/16 since “the feature is not supported for SUL”. If needed, we can get confirmation with RAN1. |
| ZTE | Yes but | Agree with Nokia, Rel-17 CR can only be endorsed now, as they might need further update later. Regarding Ericsson’s question, we have same understanding as Intel, that Rel-15/16 UE should omit the fields for SUL band based on the field descriptions. There is no need confirm with RAN1 on this aspect. |
| Qualcomm | Yes | Agree with Nokia on Rel-17 CR and also with Samsung’s comments. |
| CATT | Yes |  |

9 companies joined the discussion, all companies agree with the CRs but with comments on the contents of CRs, Several companies mentioned that it cannot be agreed now as we have no Rel-17 specifications, the CRs should be endorsed. Some companies supports the comments from Samsung. Ericsson asked the clarification for Rel-15 signalling, some companies think UE should reports 1 MIMO layer and some companies think UE can omit the fields for SUL. Rapporteur understands this is mainly a Rel-15 issue and does not impact on Rel-17 CR, the proponent can raise this issue for Rel-15. Thus, it is suggested to pursue the Rel-17 CRs with considering the comments from Samsung.

**Proposal 3: The CRs are pursued aiming to be agreed in principle, with considering the comments from Samsung.**

## Broadcast of gNB ID length

R3 TEI17 - Broadcast of gNB ID length

[R2-2100046](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_113-e\Docs\R2-2100046.zip) LS on broadcasting gNB ID length in system information block (R3-207226; contact: Ericsson) RAN3 LS in Rel-17 TEI17 To:RAN2 Cc:SA3

[R2-2101415](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_113-e\Docs\R2-2101415.zip) On broadcasting gNB ID length in SIB1 (reply LS to R3-207226) Ericsson discussion

According to the LS in R2-2100046, RAN2 is supposed to answer RAN3, which asked:

RAN3 WG respectfully asks RAN2 WG to check the feasibility of broadcasting the gNB ID’s length in system information blocks and related UE behaviour including reporting for ANR purposes.

Based on the above and the proposals in R2-2101415 (copied below), the moderator ask companies to reply the questions below.

|  |
| --- |
| [Observation 1 The current TNL address discovery is not well prepared for the RAN node ID’s flexible length.](#_Toc61531882)  [Proposal 1 Include gNB ID length in *PLMN-IdentityInfo* IE in SIB1 for each cell that is served by that gNB.](#_Toc61531880)  [Proposal 2 Include gNB ID length in reportCGI measurement report.](#_Toc61531881) |

**Q4-1 Do companies agree that Proposal 1 is feasible from RAN2 point of view? Which pros and cons do you see in the proposal?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| Huawei, HiSilicon |  | This would be too costly to broadcast.  It will not work for legacy UEs. |
| Nokia |  | From network side we are not aware of any particular issue with the current OAM based solution. In general, we ought to be very careful about SIB1 overhead. |
| Ericsson | Yes | This is required. Of course it will not work for legacy UEs but if one UE supports the new CGI reporting procedure which includes the gNB ID length, then the neighbour relations can be established and this neighbour relation can be used for legacy UEs as well (i.e., there is no need for asking the legacy UEs for CGI reporting in that case).  RAN3 has realized that the network based solution is too complex and that is the reason for LS. We believe this is not a very large overhead as this will add just 4 bits to the SIB1. |
| Samsung | Yes, but | We think it is feasible to broadcast gNB ID length in SIB1 but we can discuss actual signalling details further. |
| Apple | Yes but | Same view as Samsung |
| Lenovo | Yes but | Same view as Samsung |
| Intel | Yes but | While it is feasible, using SIB1 to provide this information that has no impact on the UE behaviour seems not every efficient use of SIB1 bits and should only be considered if there are no other better options. |
| ZTE | Yes, but | We think it is feasible, but we have similar concern as Huawei and Nokia that the solution can not work for legacy UE and will increase the load of SIB1. To provide more clear view to RAN3, we think the drawbacks identified for this solution should be included in the reply LS as well. |
| Qualcomm | Yes but | Agree with HW and Nokia. This is too late for it to be useful. RAN2/RAN3 were aware of this issue in Rel-15 and in the end it was decided to be left to NW implementation; it is not clear what changed to justify going back on this. |
| CATT | Yes but | This may work, however we tend to agree with some of the concerns raised by Huawei, Nokia, QC, etc. |

**Q4-2 Do companies agree that Proposal 2 is feasible from RAN2 point of view? Which pros and cons do you see in the proposal?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| Huawei, HiSilicon |  | It will not work for legacy UEs. |
| Nokia |  | Agree with Huawei. |
| Ericsson | Yes | Same reasoning as previous question. |
| Samsung | Yes, but | We think it is feasible but we can discuss details further. |
| Apple | Yes but | Same view as Samsung |
| Lenovo | Yes but | Same view as Samsung |
| Intel |  | Please see comments above. |
| ZTE | Yes, but | Agree with Huawei |
| Qualcomm | Yes but | Feasible but definitely not preferred option at this stage. |
| CATT | Yes but | This may work, however we tend to agree with some of the concerns raised by Huawei, Nokia, QC, etc. |

10 companies joined the discussion, 8 companies agree with it is feasible to include the gNB ID length in *PLMN-IdentityInfo* IE in SIB1 and in *reportCGI* measurement report. However, 9 companies provide the concerns/drawbacks for such solution including SIB overhead and not working for legacy UEs, and 3 companies think the actual signalling details need to be discussed further.

**Proposal 4: Reply to RAN3 with the comments raised by companies above. The draft LS reply can be discussed in Phase 2.**

# 4 Conclusions

*To be added…*

# 5 References

1. R2-2100054 LS for FR2 FWA power class (R4-2016876; contact: Softbank) RAN4
2. R2-2100896 Introducing UE capability for power class 5 for FR2 FWA SoftBank, Huawei
3. R2-2100897 Introducing UE capability for power class 5 for FR2 FWA SoftBank, Huawei
4. R2-2100950 Introduction of PC5 for FR2 Nokia, Nokia Shanghai Bell
5. R2-2100951 Introduction of PC5 for FR2 Nokia, Nokia Shanghai Bell
6. R2-2100952 Introduction of PC5 for FR2 Nokia, Nokia Shanghai Bell
7. R2-2100953 Introduction of PC5 for FR2 Nokia, Nokia Shanghai Bell
8. FR1\_35MHz\_45MHz\_BW - Release Indep R15
9. R2-2102259 LS to RAN2 on 35 and 45 MHz channel Bandwidths (R4-2017846; contact: T-Mobile) RAN4
10. R2-2101457 Support of 35 MHz and 45 MHz channel bandwidth for FR1 Apple Inc, T-Mobile
11. R2-2101458 Support of 35 MHz and 45 MHz channel bandwidth for FR1 Apple Inc, T-Mobile
12. R2-2100055 LS on removing restriction on configuring UL MIMO for SUL band (R4-2016909; contact: CMCC) RAN4
13. R2-2101612 Draft CR: Remove the maximum number of MIMO layers configuration restrictions for SUL CMCC, Huawei, HiSilicon, CATT
14. R2-2101613 Draft CR: Remove the maximum number of MIMO layers restrictions for SUL CMCC, Huawei, HiSilicon, CATT
15. R2-2100046 LS on broadcasting gNB ID length in system information block (R3-207226; contact: Ericsson) RAN3
16. R2-2101415 On broadcasting gNB ID length in SIB1 (reply LS to R3-207226) Ericsson