3GPP TSG-RAN WG2 #110-e DRAFT R2-200xxxx

Electronic meeting, 1st - 12th June, 2020

Agenda Item: 6.20

Source: RAN2 Chairman

Title: Draft Report Email 035 on TEI16 new proposals

Document for: Decision

# 1 Background

**This is the Report for the following email discussion.**

* [AT110-e][035][TEI16] New Proposals (R2 Chairman)

 Scope: Treat R2-2005159, R2-2005175, R2-2004535, R2-2004536, R2-2004537, R2-2004538, R2-2004539, R2-2005121, R2-2005184, R2-2004618, R2-2004863, R2-2005662, R2-2004601 (proponents are responsible to explain and drive)

 Part 1: Identify agreeable changes. Deadline: June 5, 0700 UTC.

 Part 2: For agreeable parts, continuation to agree CRs (may split the email discussion). Deadline: EOM

**Chairman’s overall assessment:**

* Background: NR TEI16 is a fairly large WI in R2, especially since TEI work in other groups also impact R2. Nevertheless given the nature of R15 it is natural that a significant number of small complementary fixes would be needed/desired on top of R15, some of which do not fit naturally in any other R16 WI, so this has been allowed. R2 110-e is the last point in time to look at any new TEI16 proposal that goes beyond bug-fixing (or do not stem from important operator issues).
* In order to agree a new proposal:
	+ New proposal shall be small, simple and not generate much additional discussion. It should nominally be possible to finish the CR in this meeting (1Q), and realistically MUST be possible to finish with high quality in Q3. (*Note that for TEI16 in R2, also for simple proposals, frequently companies has requested more time to think about details. Such additional time have so far been granted to have better quality and wider involvement, even if it has meant a general divergence from the 1Q-rule for TEI proposals. Now there isn’t much time in R16 any longer*).
	+ The new proposal shall pass the usual pain-gain analysis, i.e. it need to have significant support, usefulness, and limited drawbacks.
* With this in mind we can take a last look at TEI16 proposals. The following proposals has been included: Proposals that has been breifly discussed before but not yet agreed and non-discussed new proposals with >= 4 supporting companies.

# 2 Proposals and Discussion

Missing reportAddNeighMeas

Treated by email [035]

[R2-2005159](file:///D%3A/Documents/3GPP/tsg_ran/WG2/RAN2/2005_R2_110-e/Docs/R2-2005159.zip) Missing reportAddNeighMeas in periodic measurement reporting Nokia, Nokia Shanghai Bell, Ericsson, NTT DOCOMO CR Rel-16 38.331 16.0.0 1290 3 F TEI16 R2-2003109

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| Company | Comment (support/other-opinion/not acceptable), reasons |
| Ericsson | As one of the proponent companies, we agree with the CR. Our understanding is that this was a mismatch between the procedural text (that is already supporting this) and the ASN.1, where the field was missing. |
| Nokia | *Support.* |
| vivo | *Support* |
| Turkcell | *Support* |
| ZTE | No strong opinion, would be fine to support it. |
| NEC | Support basically. A question just for clarification is whether we need a field descrption for the field having exactly the same meaning as the existing one (for event-trigger) within the same *ReportConfigNR* IE? |
| Samsung | Support.  |
| Qualcomm | First, we think the current CR is incomplete because the corresponding procedure text (copied below) shows that it is mandatory for UE if Network configures the field:==============================1> if the *reportConfig* associated with the *measId* that triggered the measurement reporting includes *reportAddNeighMeas*:2> for each *measObjectId* referenced in the *measIdList* which is also referenced with *servingCellMO*, other than the *measObjectId* corresponding with the *measId* that triggered the measurement reporting:3> if the *measObjectNR* indicated by the *servingCellMO* includes the RS resource configuration corresponding to the *rsType* indicated in the *reportConfig*:4> set the *measResultBestNeighCell* within *measResultServingMOList* to include the *physCellId* and the available measurement quantities based on the *reportQuantityCell* and *rsType* indicated in *reportConfig* of the non-serving cell corresponding to the concerned *measObjectNR* with the highest measured RSRP if RSRP measurement results are available for cells corresponding to this *measObjectNR*, otherwise with the highest measured RSRQ if RSRQ measurement results are available for cells corresponding to this *measObjectNR*, otherwise with the highest measured SINR;4> if the *reportConfig* associated with the *measId* that triggered the measurement reporting includes *reportQuantityRS-Indexes* and *maxNrofRS-IndexesToReport:*5> for each best non-serving cell included in the measurement report:

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| ***reportAddNeighMeas***Indicates that the UE shall include the best neighbour cells per serving frequency. |

6> include beam measurement information according to the associated *reportConfig* as described in 5.5.5.2;======================================Since this field is already missed in Rel-15, it is impossible for all UEs to support it. Thus, at least one UE capability is required.   |
| Huawei | No strong opinion, we can accept it if most of the companies support it. We wonder if the CR cat should be C. |
| SoftBank | Support |
| BT | Support |

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| OPPO | Support  |
| NTT DOCOMO | Support (as one of the proponents) |

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| Intel | No strong view. We are ok to support it. |
| ASUSTeK | Support |
| MediaTek | No strong view. We are fine to have it. |
| Apple | Support, and would like to have a UE capability for it. |
| Interdigital | Support |
| CATT | No strong view. We are fine to have it. |

Inter Node Request of measurement identities

Treated by email [035]

[R2-2005175](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_110-e%5CDocs%5CR2-2005175.zip) Introduction of SN request of measurement identities in INM Ericsson, NEC, ZTE Corporation, Sanechips, Vivo, Softbank, Turkcell, Deutsche Telekom, NTT DOCOMO INC., China Unicom, Qualcomm Incorporated, InterDigital discussion Rel-16 TEI16

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| Company | Comment (support/other-opinion/not acceptable, reasons |
| Ericsson | As on oft he proposent companies, we agree on this. As a background, we already submitted the same contribution for Rel-15, and even if companies acknowledged that what we propose it has some benefits, they thought that this change was too late to be done for Rel-15.Regarding the two issues mentioned in the paper, we think that it should be straightforward for the SN to release the measIDs to comply with the new limit, but since we agreed on this new signaling only in April we forgot to clarify all the missing aspects.For the SN requesting a new measID limit to the MN, we believe that this it may be useful in efficiently managing the meanID space (that is common between the MN and SN) by avoiding that 1) no measID are wasted, 2) the SN have the chance to ask more measID if needed. The problem we see with the MN-initiated control of the measIDs is that is quite difficult for the MN to guess what a reasonable number of measID for the SN could be. Given that such limitations are send by the MN during the SN addition, there is still not a clear view on what is the situation at the SN. According to this, we would like to apply the same principle we have for the power sharing (on FR1 and FR2) and band combination in the inter-node message.Regarding the complexity of the solution we want to propose, there is no RAN3 impact and I would say that no major impact on RAN2, apart adding two new fields in the CG-Config. Once we have done that, normal MR-DC procedures described in 37.340 are followed and there is no change at all in those. Therefore, the DC operations on the MN and SN will continue as they do nowadays, with the difference that the SN may ask for additional measurements when the SN addition/modification are triggered.To help companies understand what ist he specification impact related to our proposal, we have uploaded tot he draft folder two CRs that show the needed changes. |
| Nokia | *There are currently other shared aspects where it is up to MN implementation for example to allocate the right amount of measurement identities between MN and SN independently. It is thus the MN that takes priority to reserve needed measurement identities no matter if the SN request is supported or not → not essential.* |
| vivo | *Support* |
| Turkcell  | *Support* |
| ZTE | We are one of the proponent companies. We share the same view with Ericsson, regarding the measID cooridination, based on RAN4 defined UE requirement, the space of supported measIDs is quite limited (e.g. In NR-DC, 10 inter-freq measIDs in total for both MN and SN configured measurements). However, different from splited number of measured frequencies, considering different application scenarios, the number of configured measurements may flactuate much more widely. So from network perspective, we would like to have a chance to allow SN to coordinate with MN about the limitations. Similar to other corrdination parameters in INM, only two fields will be introduced in CG-Config, and MN/SN signalling are exactly the same as other coordination procedures, thus we believe there is no no major impact on RAN2 signalling. |
| NEC | As one of co-sources, this is useful for the network (especially SN) operation as already explained by Ericsson above. Actually this is simply to add one more information for which the SN can request for re-negotiation to the MN. And, unlike the previous discussion for Rel-15, there seems to be no specific issue seen for Rel-16. |
| Samsung  | We understand the motivation. But this seems matter of taste, not essential one, since at least SN can respond negatively if SN cannot satisfy the given max meas Id number from MN. Then, this proposal seems the optimization at some situation.   |
| Qualcomm  | Agree with the CR. We see benefit in SN request for measurement identities when many measurements are configured. As Rel-16 TEI, we think it is a useful enhancement. |
| Huawei | We still consider it as not essential, and increases network complexity.MN will first guarantee enough measIds for itself, so it does not make much difference whether SN needs less or more.BC concerns mobility, SCell change etc.; power sharing is also complicated, and RAN2 has agreed both dynamic sharing and semi-static sharing. Whereas for measIds, the extra benefit does not justify the extra complexity.If at the end this will approved, we have the following comments for the TPs:Comments on 37340 TP:If the SN receives from the MN a new value for the maximum number of measurement identities, it is SN responsibility to ensure that its configured measurement identities ~~to~~ comply with the new limit.Comments on 38331 TP:There’s no maxMeasIdentitiesSN in 38.331, it should be changed to maxMeasIdentitiesMN |
| SoftBank | Proponent |
| BT | Neutral. We see a potential benefit but without any other coordination mechanism between the MN and the SN, it is completely up to MN what is left for the SN. |

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| OPPO | It make sense that the SN can request to change the limiation. So support. |

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| Intel | We agree that it may be benefical for SN to negogiate with MN. However, we also agree with Nokia that it can be up to MN implementation. It seems like it is not an essential feature. |
| Apple | Support. |
| Interdigital | Support/Proponent.We think this allows the network greater flexibility in using the measurement ID space using similar coordination procedures used already between MN and SN. |
| CATT | Support. |
| NTT DOCOMO | Support (as one of the proponents) |

Simultaneous NR Unicast and LTE MBMS

Treated by email [035]

[R2-2004535](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_110-e%5CDocs%5CR2-2004535.zip) Mechanisms to enable simultaneous operation of NR Unicast + LTE MBMS Qualcomm Incorporated, FirstNet, AT&T, Telstra, Academy of Broadcasting Science, Shanghai Jiao Tong University, British Broadcasting Corporation, European Broadcasting Union, Institut für Rundfunktechnik discussion Rel-16 TEI16

[R2-2004536](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_110-e%5CDocs%5CR2-2004536.zip) Introduction of simultaneous operation of NR Unicast + LTE MBMS Qualcomm Incorporated, FirstNet, AT&T, Telstra, Academy of Broadcasting Science, Shanghai Jiao Tong University, British Broadcasting Corporation, European Broadcasting Union, Institut für Rundfunktechnik CR Rel-16 38.300 16.1.0 0228 - B TEI16

[R2-2004537](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_110-e%5CDocs%5CR2-2004537.zip) Introduction of simultaneous operation of NR Unicast + LTE MBMS Qualcomm Incorporated, FirstNet, AT&T, Telstra, Academy of Broadcasting Science, Shanghai Jiao Tong University, British Broadcasting Corporation, European Broadcasting Union, Institut für Rundfunktechnik CR Rel-16 38.304 16.0.0 0159 - B TEI16

[R2-2004538](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_110-e%5CDocs%5CR2-2004538.zip) Introduction of simultaneous operation of NR Unicast + LTE MBMS Qualcomm Incorporated, FirstNet, AT&T, Telstra, Academy of Broadcasting Science, Shanghai Jiao Tong University, British Broadcasting Corporation, European Broadcasting Union, Institut für Rundfunktechnik CR Rel-16 38.306 16.0.0 0310 - B TEI16

[R2-2004539](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_110-e%5CDocs%5CR2-2004539.zip) Introduction of simultaneous operation of NR Unicast + LTE MBMS Qualcomm Incorporated, FirstNet, AT&T, Telstra, Academy of Broadcasting Science, Shanghai Jiao Tong University, British Broadcasting Corporation, European Broadcasting Union, Institut für Rundfunktechnik CR Rel-16 38.331 16.0.0 1611 - B TEI16

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| Company | Comment (support/other-opinion/not acceptable, reasons |
| Nokia | *Prefer to handle this as part of the Rel-17 WI.* |
| vivo | *For the 304 CR, maybe the UE should set the LTE MBMS frequency as the highest priority as the legacy way. The drawback of using the lowest frequency is that if the LTE MBMS frequency is not available due to a lower RSRP value. Then all the other frequencies will be at the same frequency level of the lowest.* |
| LG | *It should not be discussed in TEI16.* |
| ZTE | We agree the motivation and support the CRs. |
| NEC | We understand the concerns, while our feeling is that this would have much impact compared to other TEI proposals and probably need some work in other WGs? It seems better to discuss in RAN1 (or RAN4?) first.. |
| Samsung | We have the same view as Nokia. |
| Qualcomm | We are proponent for the proposal so will respond to above comments:In response to Nokia and Samsung, as explained in R2-2004535:*certain aspects are out of scope of the Rel-17 WI on NR MBMS as indicated in the WID [1]:**This WI aims to provide the support in RAN for Objective A, consistently with TR 23.757.**Support of Objective B (e.g. linear TV, Live, smart TV, and managed and OTT content, radio services) is not in scope of this WI…* *Rel-17 NR MBMS also indicates “No support of Free to air/receive only mode is provided in this WI.”, i.e. ROM is possible only with LTE MBMS.*Regarding vivo’s comment: thanks for the comments, we are open to discuss aspects of CRs in part 2 once general principle is agreeable.Regarding LG’s comment: could you explain why instead of just saying „should not be discussed“? As seen from the the supporting companies in the document, there is strong interest and as explained in the document this proposal confirms well with TEI guidelines.Regarding NEC’s comments: We think there is no impact to RAN1 or RAN4. The changes are on signalling to allow the scenarios mentioned. No change in requirements or PHY behaviour. |
| Futurewei | The scope and impact of this work look more than what can be handled in TEI16, especially as we are already in the last meeting to freeze the R16 functionality.It can be considered for Rel-17, and the corresponding Rel-17 WI on MBMS can be revised accordingly, if the support of the targeted use case is deemed necessary. |
| FirstNet | For service providers like us, LTE MBMS services must continue for some time to serve legacy devices. Not supporting LTE MBMS + NR unicast operation will slow down the migration towards NR unicast.This must be supported in TEI16. |

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| AT&T | We are a proponent. This seems like a straight-forward TEI issue that probably has no impact on RAN1 or RAN4. There is a need (from an operator’s point of view) for this set of TEI proposals/CRs to be agreed and included in Rel-16.  |
| Huawei | We are not sure that there is no impact in RAN1 / RAN3 / RAN4. This needs to be checked.RAN4 may need to define new band combinations for NR+LTE MBMS and their requirements.RAN1 and RAN4 may need to confirm if the LTE MBMS capability should be per BC or per band.The RAN3 impacts is probably on F1. So far in RAN3 they never discussed any implementation of MBMS on F1. Today for each new SIB set-up there is a discussion in RAN3 on where the SIB are managed between the CU and DU.On the other hand, we wonder what is possible to do in implementation, i.e. without these enhancements in the specifications. NR UEs performing NR unicast while monitoring LTE MBMS is probably still possible, as long as the UE supports separate modules for LTE MBMS reception, which could be the normal case. NR networks broadcasting LTE MBMS frequencies seems an enhancement to help UEs discovering LTE MBMS frequencies, which is not that necessary (the UE should normally know where to receive LTE MBMS).Technically, it is not clear whether the signaling is reported using EN-DC band combination. It is also not so clear whether the UE has to support EN-DC in this case. (This may need discussion in RAN2) |
| BT | We see this is a required work to be done but not as a TEI. We are not sure it can be contained in RAN2 without impact RAN1, RAN3 and/or RAN4. For example, it is not clear how this will impact an EN-DC deployment where LTE is an umbrella of multiple NR cells. Our preference is to make an amendment on Rel-17 MBMS WI.  |
| OPPO | We prefer to handle this in next release.1. It is compex topic, we need time to check the issue.
2. We are not sure if there is requriement to do this.

This meeting is the last meeting do the function issue in R16 NR, we do not think we can finish it in one meeting. |
| Intel | There are quite substantial changes from the proposed CRs, and we may need to consider architecture impact from the proposal as well. Given that the proposal just appears in this meeting and companies need some time to evaluate the proposal, we feel that the proposal might be too late for Rel-16. While this is not currently in the scope of Rel-17, this could still be considered in Rel-17 as TEI-17 with a better understanding of the benefits and impacts. |
| MediaTek | More clarificaiton may be needed on the working assumption for this proposal: “Operators deploying LTE prefer to migrate to NR sooner than later and may not want to continue to provide unicast over LTE”. The knowledge on the table is that LTE and NR will be co-existing for a long time. This apply to operators deploying NSA or SA. It is questionable to support LTE MBMS+ NR unicast from system arch perspective. In addition, LTE and LTE MBMS has the potential to be deployed at the low frequency, and NR has the potential to be deployed at the high frequency (e.g. C-band). Technically, the cell deployed at low frequency is at a better position to transmit the control information to the UE. Specific to the frequency band combination for LTE MBMS and NR unicast, RAN4 input would be helpful. Going to the details of the proposal, the usage of MBMS-InterFreqCarrierTypeList-r14 is not clear. MBMS-InterFreqCarrierTypeList-r14 describes the carrier type and frameoffset. In the context of this discussion, the carrier type should be dedicated and the mixed carrier case is ruled out. Then the carrier type is already fixed. Furthermore, the mean of frameoffset is not clear in this case. RAN1 input would be helpful. There should be no rush to put the proposal into NR Rel-16 specs at the last meeting for NR Rel-16 work. Meanwhile, It would be too early to say if it can be put into Rel-17 NR MBMS scope before the motivation on the proposal is justified and specs impact is clearly assessed. |
| Ericsson | We support the principle to operate NR unicast and LTE MBMS together. It is important for legacy and a stepping stone to transition from an "all-LTE" broadcast solution to an "all-NR" broadcast solution. That said it is quite a big change and this is the last meeting of the release. We have doubts about the impact on other groups (e.g. performance requirements in RAN4) and the amount of work required in RAN2 compared to the current work load. |
| Apple | We donot think it’s a simple change, there will be other WG’s impact. We propose to postpone the discussion in next release.  |
| Interdigital | We agree with the support of this feature, but think it can be done in the next releases given the impact of the changes. |
| CATT | We are not sure that there is no impact in RAN1 / RAN3 / RAN4. So we prefer to consider it in R17. |

FreqBandIndicator in NR redirection

Treated by email [035]

[R2-2005121](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_110-e%5CDocs%5CR2-2005121.zip) CR to 38.331 on missing freqBandIndicator in NR redirection Qualcomm Incorporated, Ericsson, MediaTek Inc., ZTE Corporation, Sanechips, Apple, Intel, OPPO draftCR Rel-16 38.331 16.0.0 F TEI16

[R2-2005184](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_110-e%5CDocs%5CR2-2005184.zip) CR to 36.331 on missing freqBandIndicator in NR redirection Qualcomm Incorporated, Ericsson, MediaTek Inc., ZTE Corporation, Sanechips, Apple, Intel, OPPO draftCR Rel-16 36.331 16.0.0 F TEI16

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| Company | Comment (support/other-opinion/not acceptable, reasons |
| Ericsson | As one oft he proponent companies, we agree on this CRs. |
| Nokia | We do not see any issue of not giving frequency band indicator. UE will get ARFCN and will be able to decode SSB/SIBs and get frequency band information from broadcast information. So the proposal seems to be quite unnecessary.Additionally in our understanding existing requirements for release 15 consider that UE is not given frequency band indicator as it is not present in the redirection. Thus we do not see any need to add this in release 16. Of course if we add we could make the requirements more strict in RAN4 but then we would need to consult RAN4 on the issue. |
| vivo | *Support* |
| Turkcell | *Support* |
| ZTE | Support. |
| NEC | This seems very important information and thus we support. |
| Qualcomm | We are proponentUnlike LTE the ARFCN-ValueNR does not encode the band number. In case of overlapping bands, the UE needs to know not only the ARFCN but also the band number in order to choose the correct filters for its measurements. In current TS38.331 and TS36.331, *freqBandIndicatorNR* is included in *MeasObjectNR*. However, it is missing in NR redirection. Then if the target cell in overlapping band, the UE may need a long time to search the correct filters for its measurements during NR redirection.As we know, during idle mode cell selection, the UE does not know which filter to use for SSB/MIB/SIB1 acquisition, and may have to change the filter after SIB1 acquisition (i.e. based on *frequencyBandList* included in NR SIB2). This is not efficient and our proposal intends to resolve this issue for redirection. It can reduce the time for the UE to search correct filter for SSB/MIB/SIB1 acqusition.Furthermore, our proposal has minor impacts on both UE and Network sides:* **UE side:** no new capabilty required. Rel-16 eNB can always provide freq band indicator. Rel-16 UE can use this information, and Rel-15 UE doesn’t understand it and thereby not apply it which fallbacks to Rel-15 situation. In either case, NW doesn’t need to know whether the UE supports it and no legacy issue.
* **NW side:** if NW know target cell is not in overlapping band, NW can simply does’t include band indicator in redirection.

Finally, as response to Nokia’s comments, we think that the current redirection requirement in 38.133 assumes that UE knows the band of the target cell and it would use correct band filter. But the propsal is intended for the scenario that target cell is in ovelapping band (i.e. need extra time to search correct filter). Thus, we don’t think this proposal has impact on RAN4 requirement.  |
| Huawei | Support |
| BT | Support |

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| OPPO | We are proponentSupport  |

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| Intel | Support. |
| MediaTek | Support.Regarding Nokia’s comment, we think currently RAN4 does not consider the case for overlapping band without band indicator. For example, they did not define different measurement requirements for the case with band indicator provided and the case without it. So, we don’t see the need to consult RAN4. The proposal is just to have additional (optional) assitance information in redirection for cell search. The reason is quite realistic in product implementation, and we think it is reasonable to have this indicator. |
| Apple | Support |
| Interdigital | Support |
| NTT DOCOMO | Similar view as Nokia. It would be nice to learn the quantitative gain of introducing this information. Given that the frequency band information can anyway be obtained from SIB1, to what extent (X msec) redirection time can be reduced? |

Reestablishment

Treated by email [035]

[R2-2004618](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_110-e%5CDocs%5CR2-2004618.zip) Updates to reestablishment procedure ZTE Corporation, Sanechips, Intel Corporation, CATT, Mediatek CR Rel-16 38.331 16.0.0 1143 6 C TEI16 R2-2002970

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| Company | Comment (support/other-opinion/not acceptable, reasons |
| Ericsson | We disagree with the proposal. It is proposed to define a basic L1 configuration, but isn’t exactly what the UE does when it applies the following below?5.3.7.3 Actions following cell selection while T311 is runningUpon selecting a suitable NR cell, the UE shall:[…]1> apply the default L1 parameter values as specified in corresponding physical layer specifications except for the parameters for which values are provided in *SIB1*;1> apply the default MAC Cell Group configuration as specified in 9.2.2;1> apply the CCCH configuration as specified in 9.1.1.2;1> apply the *timeAlignmentTimerCommon* included in *SIB1*;1> initiate transmission of the *RRCReestablishmentRequest* message in accordance with 5.3.7.4;[…]5.3.7.4 Actions related to transmission of *RRCReestablishmentRequest* messageThe UE shall set the contents of *RRCReestablishmentRequest* message as follows:[…]1> re-establish PDCP for SRB1;1> re-establish RLC for SRB1;1> apply the specified configuration defined in 9.2.1 for SRB1;[…]We acknoledge that this it may be not as efficient as in LTE, but our understanding is that what is proposed it only happens in case the network does not multiplex the RRCReconfiguration with the RRCReestablishment. Therefore, network implementation may avoid the case pointed out in the CR. |
| Nokia | We agree that it would be beneficial to enhance re-establishment procedure so that *ServingCellConfig* can be configured already in the early phase. However, we think that this can be solved in similar way than in LTE where RRC Connection Reconfiguration and RRC Re-establishment can be sent in the same TTI. Therefore, our proposal is to agree CR in R2-2004950. |
| vivo | *Support* |
| LG | *Not support* *For the first change, the UE can use default configuration to send RRC reestablishment complete message. We understand that there may be double RACH issue, but subsequent reconfiguration message can avoid the double RACH.**For the second change, we don’t want to add another case to allow reconfiguration of those parameters.*  |
| ZTE | *Support* With regards to the comment from Ericsson above, in addition to the issues pointed out by Nokia, we would like to clarify that the issue is mainly about lack of dedicated SR (or PUCCH) resource, which will trigger the RACH. This is not in the default configuration. Note that sending reconfiguration together with reestablishment won’t solve this issue because the reestablishment is first processed by the UE and the complete message is submitted as explained in the reason for change and this will trigger RACH if there is no UL grant in the meanwhile. The issue can only be solved currently by speculative grants within the unknown UE processing time until it processes the reconfiguration message and this is not efficient. So, the proposal is to simply adopt something similar to LTE. |
| Qualcomm | We believe the CR is not needed as it increase the complexity on the UE for little to no benefit:1- the readiness of re-establishment complete message (at the UE) is more or less known to the network, therefore a few extra grants around this time will save the situation (as described in the CR coverage page)2- RLF occurrence is rare, however adding significant requirement at the UE side to address such corner case is not justified. 3- the CR basically allows the UE to transmit SR to obtain UL grant, given the SR offset/periodicity configuration, this will introduce more delay to receive the grant from network and transmit the complete message (compare to approach #1), therfore we see no value in pursuing this.  |
| Futurewei | Not support.The problem is not critical, as it doesn’t occur often and network implementation can mitigate the downside. |
| Huawei | No support. The reason why in Rel-15 we do not include configuration in reestablishment procedure, is mainly because this msg only has integrity protection, but no ciphering. So from security point of view, we don’t want to extend this. |
| OPPO | Not support based on the below reason:1. For the RACH issue due to deleiver the RRCreestablishmentCompelte message, it was discussed in RAN2#104 meeting.

Agreements1: No change is made to the specifications. RACH, if needed, is considered acceptable for the re-establishment Complete.2: No change is made to the specifications. No additional L2 parameter updates will be supported with first reconfiguration after re-establishment. FFS Can be discussed whether the re-establishment processing time could be relaxed so that a UE implementation could avoid the RACHFor the configuration in RCReestablishment message issue i wonder whether it is allowed due to the RCReestablishment message is not cipherred.  |
| Intel | Support.It seems an unnecessary limitation to not allow the network to provide configuration that could be useful. In response to Ericsson comment, there is no certainty for the UE that the network will provide both messages together. UE implementation by default will process one message at a time in sequence before processing the second mesage. After processing the re-establishment, the UE will deliver the re-establishment complete to the lower layers.Providing this configuration in re-establishment is simple solution to avoid the second RACH and has been used in LTE. |
| MediaTek | Support.We understand that some companies argue that this is RLF, so is not frequent and NW could handle it, so not essential. I guess that’s true so we don’t fix this in Rel-15. Then, in Rel-16, we still think it is better to avoid double RACH procedure in this scenario. In LTE, the same apporach is used and there seems no security issue on providing the basic SR configuration. We therefore prefer to solve this as in the proposed CR.Other suggstion is that we believe a capability bit is requires for this function (if agreed). |
| Apple | Not Support. The proposal was not agreed in R15 due to the security issue. And the situation is not changed in R16, and the security risks still exist. |
| Interdigital | When re-establishment was discussed in Rel15, the assumption was that the RRC re-establishment and the RRC reconfiguration could be multiplexed in the same TTI. For that reason, it seems this problem can be avoided by NW implementation. |
| CATT | Support.We think the restriction in R15 is not necessary. It’s better to avoid double RACH procedure in this scenario, at least from R16.  |
| NTT DOCOMO | It was discussed at RAN2 #104 and concluded that RACH, if needed, is considered acceptable for the re-establishment Complete. Although it is nice to avoid RACH, but not sure if RACH is critical so that it should be avoided, unless there is congestion. |

PDCP security issue

Treated by email [035]

[R2-2004863](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_110-e%5CDocs%5CR2-2004863.zip) CR on PDCP security issue about duplicate detection Samsung, LG Electronics Inc., Nokia, Nokia Shanghai Bell, LG Uplus, Deutsche Telekom, NTT DOCOMO, Intel, Huawei, HiSilicon CR Rel-16 38.323 16.0.0 0032 6 F TEI16 R2-2003825

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| Company | Comment (support/other-opinion/not acceptable, reasons |
| Nokia | *Support* |
| vivo | *Support*  |
| LG | *Support* |
| ZTE | Support |
| NEC | We support the propsal including early implementation. |
| Samsung | *Support* |
| Qualcomm | It seems to be only a spec text refinement. A good UE implementation will not treat the discard PDU as received one. There is no problem if we keep the legacy text. So, we don’t think this CR is needed. |
| Futurewei | We appreciate the intention, but the proposed change seems awkward to consider a received packet not received. Would it be more straightforward to just change the condition “has been received before” to “has been stored in the reception buffer before”, as follows?“After determining the COUNT value of the received PDCP Data PDU = RCVD\_COUNT, the receiving PDCP entity shall:- perform deciphering and integrity verification of the PDCP Data PDU using COUNT = RCVD\_COUNT;- if integrity verification fails:- indicate the integrity verification failure to upper layer;- discard the PDCP Data PDU ~~and consider it as not received~~;- if RCVD\_COUNT < RX\_DELIV; or- if the PDCP Data PDU with COUNT = RCVD\_COUNT has been ~~received~~ stored in the reception buffer before:- discard the PDCP Data PDU;If the received PDCP Data PDU with COUNT value = RCVD\_COUNT is not discarded above, the receiving PDCP entity shall:... „ |
| Huawei | Support (cosigning) |
| BT | *Support* |
| OPPO | We think current spec is already clear enoug and the CR is not needed, because if the PDCP data PDU is discarded due to integrity verificaiton failure, the later procedure will not be performed. Thus, in our understanding, the smart UE will regrad this PDCP data PDU as not received. |
| Intel | Support. |
| ASUSTeK | Support |
| MediaTek | Agree with Qualcomm. This CR seems not needed. |
| Ericsson | We support the CR. |
| Apple | Support. |
| Interdigital | Support |
| CATT | Support |
| Fujitsu | We are fine but there is also same duplication discarding problem. If a PDCP PDU that has reserved or invalid values is received, the current spec just says it is discarded. Afterwards, if an authentic PDCP PDU with the same SN is received, it will be also discarded by duplicate detection. The text below can fix the same problem.5.10 Handling of unknown, unforeseen, and erroneous protocol dataWhen a PDCP PDU that contains reserved or invalid values is received, the receiving PDCP entity shall:- discard the received PDU and consider it as not received. |
| NTT DOCOMO | Support (as one of the proponents) |

Retransmission of an RLC SDU with a poll after discard

[R2-2005662](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_110-e%5CDocs%5CR2-2005662.zip) Retransmission of an RLC SDU with a poll after discard procedure LG Electronics Inc., Ericsson, NTT Docomo, LG Uplus, Sharp discussion Rel-16 TEI16 R2-2002998

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| Company | Comment (support/other-opinion/not acceptable, reasons |
| Nokia | *We are not sure if this is a critical issue although we acknowledge such occasion is possible to happen:**- for the case the last RLC SDU becomes unavailable right before transmission due to PDCP discardTimer expiry seems a corner case;**- for the case of PDCP duplication deactivation, NW can proactively transmit a STATUS PDU for the secondary RLC entity after deactivating the duplication.* |
| vivo | *We think that this issue can be handled by the network implementation (e.g. by sending the STATUS PDU at the PDCP duplication deactivation).* |
| LG | *With PDCP duplication, the RLC SDU with a poll would be frequently discarded (e.g. when a PDCP PDU is successfully transmitted by one RLC entity, the PDCP indicates all other RLC entities to discard the duplicated PDCP PDU). If there is no RLC SDU in the UE buffer after the SDU discard, the RLC entity would be stuck because there is no RLC SDU to transmit a poll. In other words, the fail-safe mechanism which triggers the poll for the last RLC PDU in the buffer doesn't work when the last RLC SDU in the buffer is discarded.**Comment on Nokia and vivo’s answer above:**Even if the NW proactively transmits a STATUS PDU after PDCP duplication deactivation, if the receiving RLC entity at the NW fails to receive the last transmitted data from the transmitting RLC entity, the STATUS PDU cannot contain this missing data information and finally the problem cannot be solved.*  |
| Samsung | We have some sympathy with this motivation. However, we think this issue is mainly about the second AM RLC entity. Regardless of activation or deactivation, we still have the primary AM RLC entity. Even if the secondary AM RLC entity is stuck and no new data comes, data transmission and reception would be still on-going via the primary AM RLC entity, e.g. PDCP SDU corresponding to last transmitted data(RLC PDU via the secondary RLC entity) will somehow arrive at the receiver via the primary AM RLC entity. Upon reactivation and the reception of new data, the secondary RLC entity gets free from being stuck. So no critical problem would be foreseen. |
| Qualcomm | Support |
| Futurewei | Not supportPDCP duplication is to provide reliability with minimum latency. Hence, it typically works with RLC UM mode. Therefore, we don’t see Rel-16 works introduce new issue to RLC polling in AM mode, and don’t think this change is needed.  |
| Huawei | Technically we see some benefit. However, we understand the motivation is to poll the receiver in order to receive the status report quickly. But it can rely on the NW implementation, for instance, NW can freely trigger the status report along with the PDCP duplication deactivation command. So it can achieve the same effect without standard impact. Another way is to wait for the T-reassembly timer expires at the receiver side so that the status report will be triggered as well |
| OPPO | We are dont think this is a criticial issue since, we have sympathy on Nokia and Futurewei’s comments. |
| Intel | Agree with Nokia, vivo, and Samsung. There seems to be no critical issue. |
| MediaTek | Support |
| Ericsson | We support the CR. |
| Apple | Support |
| Interdigital | Support |
| Fujitsu | Need more analysis from the following perspective:We appraciate to discuss this potential issue. We wonder if the potential issue occurs discussed in this tdoc typlicall ocurs in case of URLLC data with PDCP duplication. According to URLLC guidance, the data error rate is 10-5 and data can be sent within 1ms latency. Given that this is assumption, the 1st issue (the last RLC SDU waiting to be transmitted in one of the RLC entities is discarded by an indication from higher layers.) does not tipically occur because RLC SDUs can be transmitted within 1ms latency before PDCP SDU discard indication. Also, the 2nd issue (the secondary RLC entity cannot finalize its transmission and retransmission after PDCP duplication is deactivated) does not typlically occurs becaus of the same reason. |
| NTT DOCOMO | Support (as one of the proponents) |

CFRA resource handling for BFR upon TAT expiry

[R2-2004601](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_110-e%5CDocs%5CR2-2004601.zip) CFRA resource handling for BFR upon TAT expiry Nokia, Nokia Shanghai Bell, Apple, ASUSTek discussion Rel-16 TEI16

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| Company | Comment (support/other-opinion/not acceptable, reasons |
| Nokia | *Support.* |
| Vivo | *In the Rel-16 2-step RACH WI, we have already introduced a new 12 bit TAC MAC CE (i.e.* Absolute Timing Advance Command MAC CE*) which could be used in this case.* |
| LG | *We think it would be better to reuse already defined MAC CE, i.e. Absolute Timing Advance MAC CE, in this case. We understand that this MAC CE is currently limited to 2-step RA case, but we don’t see any problem to use this MAC CE for other cases. Thus, we propose to remove the restriction in section 5.2. as follows.*1. when an Absolute Timing Advance Commandis received:

2> apply the Timing Advance Command for PTAG;2> start or restart the *timeAlignmentTimer* associated with PTAG. |
| NEC | *support to solve the issue. For the way of solving, it seems the alternative proposal from LG, if applicable, looks better (but no strong view for solution).* |
| Samsung | We do not see any issue here, and thus no changes are needed. First of all, the case itself is a corner case: BFR happens and TAT expires at the same time. As in the contribution, even if it happens, network can send PDCCH order after completion of CFRA for BFR, so nothing is broken. Furthermore, network can also respond with PDCCH order—which is also addressed to C-RNTI—in response to CFRA BFR preamble, which will also complete the CFRA BFR and network can provide proper TA value after receiving another preamble. To release the dedicated resources upon expiry of TAT which requires reconfiguration seems a bit overengineering and unnecessary. |
| Qualcomm | The issue described in the paper was valid in R15. But in R16, 12-bit absolute timing advance command MAC CE was introduced. And there is no restriction on which type of RNTI (C-RNTI or RA-RNTI) this new TAC MAC CE has to be scheduled with. Therefore, this new absolute TAC MAC CE can be sent in the msg2 for CFRA based BFR, and CFRA resources for BFR do not have to be released upon TAT expiry. |
| Futurewei | Agree with Vivo, LG, and Qualcomm. |
| Huawei | Discussed in Rel-15, but not agreed. It is rare case that TAC MAC CE is not sufficient to compensate the UL timing shift, which is expected to be adjusted by the NW. |
| BT | As others have noted, re-use what is defined for 2-step RACH should be sufficient. |
| OPPO | We also think it’s not criticial issue anyway network can trigger PDCCH order based CFRA for uplink synchronization. We also think R16 12 bit absolute timing advance command MAC CE can be used here. |
| Intel | We share the same view with Samsung that the issue might be a corner case, and currently gNB has tools to handle this. If RAN2 agrees to solve the issue, we’re OK with the proposed solution by LG (using 12 bit TAC MAC CE). |
| ASUSTeK | Support as one of the proponent companies. Since Absolute Timing Advance MAC CE is not introduced for this situation, we prefer a simpler approach as proposed in the Tdoc. |
| MediaTek | Not essential. Without it, there will be no impact to UE performance. |
| Ericsson | Solution 2 is already available. Is there really a problem anymore? |
| Apple | Support. The proposal is simple and can improve the BFR dedicated resource efficiency. |
| CATT | We do not see any issue here, and thus no change is needed. |
| Fujitsu | Not essential.We appreciate to discuss the potential issue. The assumption of the CFRA-BFR is that UE gets UL timing alighment. Therefore, the NW can carefuly configure the value of TAT e.g. large value it the NW wishes to use CFRA-BFR. |
| NTT DOCOMO | Incline to the view from Samsung that NW can trigger PDCCH ordered RA after CFRA for BFR, though it incur the delay of whole procedure. On the other hand, We also agree that the new TAC MAC CE introduce for 2-step RACH could be used for this purpose. |

Dynamic LCP mapping restrictions – not yet agreed

Treat on-line

[R2-2004512](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_110-e%5CDocs%5CR2-2004512.zip) Dynamic LCP Mapping Restrictions Nokia, Deutsche Telekom, Ericsson, Fujitsu, Nokia Shanghai Bell, NTT DOCOMO INC., T-Mobile CR Rel-16 38.300 16.1.0 0226 - B TEI16

[R2-2004514](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_110-e%5CDocs%5CR2-2004514.zip) Dynamic LCP Mapping Restrictions Nokia, Deutsche Telekom, Ericsson, Fujitsu, Nokia Shanghai Bell, NTT DOCOMO INC., T-Mobile CR Rel-16 38.321 16.0.0 0740 - B TEI16

[R2-2004515](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_110-e%5CDocs%5CR2-2004515.zip) Dynamic LCP Mapping Restrictions Nokia, Deutsche Telekom, Ericsson, Fujitsu, Nokia Shanghai Bell, NTT DOCOMO INC., T-Mobile CR Rel-16 38.331 16.0.0 1610 - B TEI16

[R2-2004519](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_110-e%5CDocs%5CR2-2004519.zip) Dynamic LCP Mapping Restrictions Nokia, Deutsche Telekom, Ericsson, Fujitsu, Nokia Shanghai Bell, NTT DOCOMO INC., T-Mobile CR Rel-16 38.306 16.0.0 0309 - B TEI16

[R2-2005663](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_110-e%5CDocs%5CR2-2005663.zip) Consideration on LCP mapping restrictions LG Electronics Inc. discussion Rel-16 TEI16

[R2-2004511](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_110-e%5CDocs%5CR2-2004511.zip) Offline 053 on LCP Mapping Restrictions Nokia (Rapporteur) discussion Rel-16 TEI16 R2-2004114

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| Company | Comment (support/other-opinion/not acceptable, reasons |
| **Chairman** | **NOTE:** IF you commented last meeting you don’t need to comment in this table/email discussion. The Offline Summary from last meeting in R2-2004511 (above) will be taken into account and treated. Please do not repeat comments from last meeting, List here **only** delta comments or additional information.  |
| LG | The Oppo’s proposal R2-2004556, R2-2004557 should be discussed together. We think Oppo’s proposal is better, if RAN2 decides to do something. |
| Huawei | Dynamic LCP restriction and LCH-Cell restriction lift are two separate issues, and we don’t see a common approach can be used to resolve both issues. We can only agree on the CA duplication case with a RRC approach or a MAC CE approach. |
| OPPO | The motivation to introduce MAC CE based dynamic LCP restriction is not clear and we don’t think there is any criticial issue if we don’t do so. We agree LCH-Cell restriction is another issue which is different from this one. |
| MediaTek | Our view st hat improving TCP performance over NR links is something 3GPP should look at, as it has a significant impact on the end-user QoE. With regards to this discussion, there are several aspects to consider such as:1. The UE has more accurate information on the TCP state as the TCP endpoint is typically in the same device2. More tools than LCP restrictions are available to control QoS in NRTherefore while we sympathise with the problem that Nokia et al are trying to solve (and have been trying to raise awareness on this issue for a while now), we think a more holistic approach is needed when addressing TCP issues over NR links. |
| CATT | 1. LCH-to-cell restriction is not a sub-branch of dynamic LCP. It has been mentioned by many companies in TEI16 and IIOT and different solutions were provided.
2. For dynamic LCP, we share the view of MTK.
 |

# 4 Proposals