**3GPP TSG-RAN WG4 Meeting # 104-e R4-2214122**

**Electronic Meeting, 15 – 26 August 2022**

**Agenda item:** 5.3

**Source:** Moderator (Apple)

**Title:** Email discussion summary for [104-e][202] Maintenance\_R17\_RRM

**Document for:** Information

# Introduction

* In this email thread, R17 RRM maintenance is discussed and include AI 5.2.3, 5.2.4.3, and 8.2.2.
  + It is noted that there is no contribution under AI 8.2.2 in this meeting

It is appreciated that the delegates for this topic put their contact information in the table below.

Contact information

|  |  |  |
| --- | --- | --- |
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Note:

1. Please add your contact information in above table once you make comments on this email thread.
2. If multiple delegates from the same company make comments on single email thread, please add you name as suffix after company name when make comments i.e. Company A (XX, XX)

# Topic #1: On R17 MUSIM gap related issues

*Main technical topic overview. The structure can be done based on sub-agenda basis.*

## Companies’ contributions summary

|  |  |  |  |
| --- | --- | --- | --- |
| **T-doc number** | **Title** | **Company** | **Proposals / Observations** |
| [**R4-2211891**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2211891.zip) | On R17 MUSIM RRM remianing issue | Apple | Proposal 1: mandatory MUSIM gap is not considered in R17. |

## Open issues summary

*Before e-Meeting, moderators shall summarize list of open issues, candidate options and possible WF (if applicable) based on companies’ contributions.*

### Sub-topic 1-1: mandatory MUSIM gap in R17.

*Sub-topic description:*

*Open issues and candidate options before e-meeting:*

**Issue 1-1: whether mandatory MUSIM gap needs to be considered in R17**

* Proposals
  + Option 1: Yes
  + Option 2: No (Apple)
  + Option 3: others
* Recommended WF
  + TBA

|  |  |
| --- | --- |
| **Company** | **Comments** |
| Apple | Support option 2. |
| MTK | Support option 2. Since RAN4 has not defined RRM requirements for Rel-17 MUSIM gaps anyway, we should not have a mandatory MUSIM gap. |
| Ericsson | Option 1  If no mandatory MUSIM gap pattern is introduced, different UEs may implement different MUSIM GPs. When UE requests MUSIM GP, NW may NOT configure the MUSIM GP to UE based on current agreed mechanism in RAN2. NW can choose either configure the same gap as UE request or NOT configure gap. In other words, either UE implements the same MUSIM GP suggested by NW or no MUSIM GP will be configured.  Mandatory MUSIM GP is the guideline to both UE and NW-A to choose the most possibility gap to implement for this feature.  In last meeting, some companies said the MUSIM GP should also consider NW-B’s configuration. We think it’s reasonable. If we define the mandatory gaps, it will also be a guideline to NW-B to configure a different configuration which cannot be supported by NW-A. MUSIM mandatory gap pattern is also the guideline to NW-B which wants the UE to camp in Idle mode successfully. MUSIM mandatory gap pattern can build the common understanding among NW-A, NW-B and UE. |
| vivo | Support option 2 |
| OPPO | Support option 2 |
| Qualcomm | Support option 2. |
| Nokia | Our preference is option 1.  By having at least one MUSIM common among UEs (and the network) will increase the likelihood of being able to have gain from the feature in R17. From network side it is not reasonable to assume supporting all possible MUSIM GPs based on that any UE in the field can request any of MUSIM GPs.  If not having at least one mandatory MUSIM gap the question would then be which MUSIM GP(s) to support from network side? This is of course very difficult to decide for the network and it could simply end up that any selected MUSIM GPs will only be supported by a few devices. This leaves all other devices without any MUSIM gaps and network will have to cope with devices which can be allocated a MUSIM gap and devices which cannot. |
| Huawei | Support option 2. |

### CRs/TPs comments collection

*For close-to-finalize WIs and maintenance work, comments collections can be arranged for TPs and CRs. For ongoing WIs, suggest to focus on open issues discussion on 1st round.*

|  |  |  |  |
| --- | --- | --- | --- |
| **CR/TP number** | **title** | **company** | **Comments collection** |
| [**R4-2213749**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2213749.zip) | Formal CR to 38.133: Corrections on MUSIM gaps | MediaTek inc. | Apple: fine with the CR |
|  |  |  | Ericsson: OK |
|  |  |  | vivo: OK |
|  |  |  | Qualcomm : Ok with CR. |
|  |  |  | Nokia: CR is agreeable. |
| [**R4-2212030**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2212030.zip) | CR to MUSIM gap configuration for MUSIM requirements applicability | OPPO | Apple: generally fine. However, whether and how to clarify requirements do not apply if other gap is configured is being discussed under R17 MG WI. We suggest waiting for that conclusion. |
|  |  |  | MTK:   * No strong view to add a clarification in Rel-17 spec. In our view, this means we need to remove some of them during Rel-18 WI phase. * We would like to understand why concurrent gap (Section 9.1.8) is not mentioned in the list. In our view, Rel-17 MUSIM gaps do not have the association nor the priority levels. So there are also not able to be configured together with concurrent gaps. |
|  |  |  | Ericsson: Do not agree with the CR, since no requirement will be defined in R17 |
|  |  |  | vivo: Do not agree with the CR. Same reason as Ericsson |
|  |  |  | OPPO: In R17, the joint configuration between MUSIM gap and other enhanced gap features are not supported in RAN4. However, such the configuration is not excluded from signaling in RAN2. We think either RAN2 or RAN4 spec should explicitly exclude such the configuration. That is why we propose this CR. If companies have concerns that “no requirements” will defined in R17, we can modefied “The requirements related to MUSIM gap apply provided” to “UE can be configured with MUSIM gap only when:”  To MTK: we agree that some configuration can be removed in R18. In our view, when multiple MUSIM gaps are configured, it can be considered as a special concurrent gap scenario. But we are also fine to add concurrent gaps in the list. |
|  |  |  | Qualcomm: The change about “requirements applicability” does not need to be added now since there are no requirements defined yet. Requirements will be discussed in R18 and the discussion is just starting in this meeting.  Other changes are OK: Up to 3 periodic gaps can be configured. MUSIM capabilitiy is musim-GapPreference. We suggest to merge with R4-2213749. |
|  |  |  | Nokia:   * Change ‘The maximum number of periodic MUSIM gaps are changed from 2 to 3’: is agreeable (same change as in R42213749) * Change ‘MUSIM capability is updated according to the lasted RAN2 signalling’: is agreeable * Change ‘For MUSIM RRM requirements applicability, gap combinations for different gap enhancement features are excluded’: need more discussion. We agree that MUSIM cannot be configured together with any other gap. Hence, cannot be configured concurrently with other gaps for UEs supporting concurrent gaps feature. However, this is also discussed under MG enhancement AI and should be addressed there in our view (as this issue is part of concurrent gaps applicability) |
|  |  |  | Huawei: we also think the changes related to requirement applicability is not needed since there is no requirement in Rel-17. If we change it to “UE can be configured with MUSIM gap only when:”, it will impose restriction to the NW configuration, and may be out of RAN4 scope (RAN4 is focused on requirements). |
| **[R4-2212686](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2212686.zip)** | Correction of UE behavior outside gaps | Nokia, Nokia Shanghai Bell | Ericsson: OK |
|  |  |  | vivo: Understand the intention however we do not see strong necessity to have this clarification. For example apparently there is no interruption outside MUSIM gaps due to MUSIM operation. In addition the meaning of unavailability is not clear. |
|  |  |  | Qualcomm : This issue is within the scope of discussion of MUSIM requirements in Rel-18. Postpone the CR until RAN4 reaches agreements. |
|  |  |  | Nokia: Thanks Vivo and Qualcomm for your comments.  To Vivo:  We understand that once the UE is assigned MUSIM gaps Network A requirements should be maintained outside of the gaps. Therefore we think that the clarification is necessary to prevent additional interruptions outside of the MUSIM gaps due to the MUSIM operation.  To Qualcomm:  Regarding the scope discussion, even though it is also discussed in Rel 18, the MUSIM gaps are available starting from Rel 17.  Therefore, the behavior outside of the MUSIM gaps would need to be clarified also for Rel 17, otherwise we will have umpredictable UE behavior. |
|  |  |  | Huawei: We have similar view as QC. For example, if Rel-18 we are discussing proximity condition between MUSIM gap and legacy gap, and a legacy gap outside MUSIM gap can be also impacted by the MUSIM gap if proximity condition is met. We are not sure if this is considered as interruptions or unavailability due to MUSIM gap. |

## Summary for 1st round

### Open issues

*Moderator tries to summarize discussion status for 1st round, list all the identified open issues and tentative agreements or candidate options and suggestion for 2nd round i.e. WF assignment.*

|  |  |
| --- | --- |
|  | **Status summary** |
| **Issue 1-1: whether mandatory MUSIM gap needs to be considered in R17** | ***whether mandatory MUSIM gap needs to be considered in R17***  *Yes: Ericsson, Nokia*  *No:apple, MTK, vivo, OPPO, Qualcomm, Huawei*  *Recommendations for 2nd round:*  *Moderator: Considering this is a TEI item, which is supposed to be concluded in one quarter, it is recommended to follow the majority view that mandatory MUSIM gap is not considered in R17.* |

### CRs/TPs

*Moderator tries to summarize discussion status for 1st round and provides recommendation on CRs/TPs Status update*

*Note: The tdoc decisions shall be provided in Section 3 and this table is optional in case moderators would like to provide additional information.*

|  |  |
| --- | --- |
| **CR/TP number** | **CRs/TPs Status update recommendation** |
| XXX | *Based on 1st round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |

## Discussion on 2nd round (if applicable)

### Sub-topic 1-1: mandatory MUSIM gap in R17.

*Moderator: Considering this is a TEI item, which is supposed to be concluded in one quarter, it is recommended to follow the majority view.*

Proposal: mandatory MUSIM gap is not considered in R17.

|  |  |
| --- | --- |
| **Company** | **Comments** |
| Ericsson | Technically, if no mandatory MUSIM gap pattern introduced, NW-B doesn’t know which MUSIM pattern is supported by NW-A. When NW-B configures the DRX cycle in Idle mode, UE may not request the MUSIM gap from NW-A since NW-A may not support the related MUSIM gap for NW-B’s DRX cycle. The only way to make this MUSIM gaps work is to introduce a mandatory gap pattern in spec which can be known by both NW-A and NW-B.  However, considering no requirement in Rel-17 and the discussion on-going in Rel-18, we can compromise to moderator’s proposal as follow.  *mandatory MUSIM gap is not considered in R17 but continue the discussion in R18.* |
| vivo | Ok with the recommended WF. |
| Apple | Fine with the recommended WF. |
| Nokia | We agree with Ericsson’s view on the topic. It is important that at least few mandatory gap patterns are introduced. |
| MTK | We support the proposal from Moderator. |
| Huawei | Fine with the recommended WF. |

### CRs/TPs comments collection

*For close-to-finalize WIs and maintenance work, comments collections can be arranged for TPs and CRs. For ongoing WIs, suggest to focus on open issues discussion on 1st round.*

|  |  |  |  |
| --- | --- | --- | --- |
| **CR/TP number** | **title** | **company** | **Comments collection** |
| **[R4-2212030](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2212030.zip)** | CR to MUSIM gap configuration for MUSIM requirements applicability | OPPO | Apple: generally fine. However, whether and how to clarify requirements do not apply if other gap is configured is being discussed under R17 MG WI. We suggest waiting for that conclusion. |
| MTK:   * No strong view to add a clarification in Rel-17 spec. In our view, this means we need to remove some of them during Rel-18 WI phase. * We would like to understand why concurrent gap (Section 9.1.8) is not mentioned in the list. In our view, Rel-17 MUSIM gaps do not have the association nor the priority levels. So there are also not able to be configured together with concurrent gaps. |
| Ericsson: Do not agree with the CR, since no requirement will be defined in R17 |
| vivo: Do not agree with the CR. Same reason as Ericsson |
| OPPO: In R17, the joint configuration between MUSIM gap and other enhanced gap features are not supported in RAN4. However, such the configuration is not excluded from signaling in RAN2. We think either RAN2 or RAN4 spec should explicitly exclude such the configuration. That is why we propose this CR. If companies have concerns that “no requirements” will defined in R17, we can modefied “The requirements related to MUSIM gap apply provided” to “UE can be configured with MUSIM gap only when:”  To MTK: we agree that some configuration can be removed in R18. In our view, when multiple MUSIM gaps are configured, it can be considered as a special concurrent gap scenario. But we are also fine to add concurrent gaps in the list. |
| Qualcomm: The change about “requirements applicability” does not need to be added now since there are no requirements defined yet. Requirements will be discussed in R18 and the discussion is just starting in this meeting.  Other changes are OK: Up to 3 periodic gaps can be configured. MUSIM capabilitiy is musim-GapPreference. We suggest to merge with R4-2213749. |
| Nokia:   * Change ‘The maximum number of periodic MUSIM gaps are changed from 2 to 3’: is agreeable (same change as in R42213749) * Change ‘MUSIM capability is updated according to the lasted RAN2 signalling’: is agreeable * Change ‘For MUSIM RRM requirements applicability, gap combinations for different gap enhancement features are excluded’: need more discussion. We agree that MUSIM cannot be configured together with any other gap. Hence, cannot be configured concurrently with other gaps for UEs supporting concurrent gaps feature. However, this is also discussed under MG enhancement AI and should be addressed there in our view (as this issue is part of concurrent gaps applicability) |
| Huawei: we also think the changes related to requirement applicability is not needed since there is no requirement in Rel-17. If we change it to “UE can be configured with MUSIM gap only when:”, it will impose restriction to the NW configuration, and may be out of RAN4 scope (RAN4 is focused on requirements). |
| vivo (2nd): To our understanding RAN2 is discussing the gap coordination issue hence better to wait for RAN2’s conclusion on related issue. |
| **[R4-2212686](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2212686.zip)** | Correction of UE behavior outside gaps | Nokia, Nokia Shanghai Bell | Ericsson: OK |
| vivo: Understand the intention however we do not see strong necessity to have this clarification. For example apparently there is no interruption outside MUSIM gaps due to MUSIM operation. In addition the meaning of unavailability is not clear. |
| Qualcomm : This issue is within the scope of discussion of MUSIM requirements in Rel-18. Postpone the CR until RAN4 reaches agreements. |
| Nokia: Thanks Vivo and Qualcomm for your comments.  To Vivo:  We understand that once the UE is assigned MUSIM gaps Network A requirements should be maintained outside of the gaps. Therefore we think that the clarification is necessary to prevent additional interruptions outside of the MUSIM gaps due to the MUSIM operation.  To Qualcomm:  Regarding the scope discussion, even though it is also discussed in Rel 18, the MUSIM gaps are available starting from Rel 17.  Therefore, the behavior outside of the MUSIM gaps would need to be clarified also for Rel 17, otherwise we will have umpredictable UE behavior. |
| Huawei: We have similar view as QC. For example, if Rel-18 we are discussing proximity condition between MUSIM gap and legacy gap, and a legacy gap outside MUSIM gap can be also impacted by the MUSIM gap if proximity condition is met. We are not sure if this is considered as interruptions or unavailability due to MUSIM gap. |
| vivo (2nd round): suggest to postpone it until RAN4 agreement at Rel-18. |
| Nokia (2nd round)  To Vivo/Huawei:  It is our understanding that in Rel 17 MUSIM gaps can already be configured and therefore the UE behaviour has to be defined. In this CR we try to clarify that issue indicating that outside MUSIM gaps legacy requirements apply, considering that the gaps are provided.  It is important to clarify at this point in Rel 17, otherwise the UE behaviour is unpredictable. |

## Summary for 2nd round

Proposal: *mandatory MUSIM gap is not considered in R17. The discussion will continue in R18 MUSIM WI.*

# Topic #2: on NR RRM Idle mode and number of serving carriers in SA

*Main technical topic overview. The structure can be done based on sub-agenda basis.*

## Companies’ contributions summary

|  |  |  |  |
| --- | --- | --- | --- |
| **T-doc number** | **Title** | **Company** | **Proposals / Observations** |
| [**R4-2212762**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2212762.zip) | Remaining issue for Idle mode | Ericsson | ***Observation 1: If the UE is configured with eDRX\_IDLE cycle in NR FR2, the search time is update to***   * *max(10s, N1\*eDRX cycle) when eDRX cycle is less than 20.48s;* * *otherwise, max(10s, eDRX cycle)*   ***Proposal 1: RAN4 to introduce the max function for timer T = max(10s, [K1]\*N1\*M1\*DRX cycles), where N1 is defined in Table 4.2.2.2-1, and K1 is 16 if DRX cycle is 0.32s, 8 if DRX cycle is 0.64s, otherwise, K1 = 4.***   * ***If UE hasn’t found any suitable cell during 10s, UE can extend the search time to T = max(10s, [K1]\*N1\*M1\*DRX cycles).***   ***Proposal 2: RAN4 to introduce the max function for timer T = max(10s, M1\*(******P1s +K1)\*DRX cycles) for NR-U, where***   * + ***K1 is 16 if DRX cycle is 0.32s, 8 if DRX cycle is 0.64s, otherwise, K1 = 4.***   + ***P1s is the number of DRX cycles each with at least one SMTC occasion not available during the TPLMN and P1s ≤ P1s,max.***   + ***P1s,max = 32 if DRX cycle is 0.32s; 16 if DRX cycle is 0.64s, otherwise, P1s,max = 8.***   ***Proposal 3: The UE shall initiate cell selection procedures for the selected PLMN if P1s exceeds P1s,max.*** |
| [**R4-2212856**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2212856.zip) | Discussion on suitable cell search in Idle mode and number of serving carriers in SA | Nokia, Nokia Shanghai Bell | 1. Common configuration in idle mode does not include a detailed neighbor cell list. 2. UE shall search regardless of the measurement rules currently limiting UE measurement activities. 3. The UE may search for up to 10s seconds. 4. The UE shall perform a full search on all configured inter-frequency and inter-RAT carriers indicated in the system information.   FR1 and LTE carrier search will not impact the existing 10 second requirement.  In some NR FR2 scenarios the UE may not be able to search all configured NR FR2 carriers.  It does not seem reasonable to define an extremely long extended search time as general requirement to cover one very specific configuration.  Hence, in general we propose following:   1. No need to change the existing fixed 10 second search limit before UE shall initiate cell selection   However, if the group agree that there is a need to also cover requirements for the very extreme FR2 configuration option, any new requirements will then need to account the more detailed FR2 conditions.  For the purpose of illustration, we have provided such proposal in a CR [4] |

## Open issues summary

*Before e-Meeting, moderators shall summarize list of open issues, candidate options and possible WF (if applicable) based on companies’ contributions.*

### Sub-topic 2-1: Cell Selection in IDLE mode FR2

*Sub-topic description*

*Open issues and candidate options before e-meeting:*

**Option 1(Ericsson): RAN4 to introduce the max function for timer T = max(10s, [K1]\*N1\*M1\*DRX cycles), where N1 is defined in Table 4.2.2.2-1, and K1 is 16 if DRX cycle is 0.32s, 8 if DRX cycle is 0.64s, otherwise, K1 = 4.**

**If UE hasn’t found any suitable cell during 10s, UE can extend the search time to T = max(10s, [K1]\*N1\*M1\*DRX cycles).**

**Option 2 (Nokia): No need to change the existing fixed 10 second search limit before UE shall initiate cell selection**

|  |  |
| --- | --- |
| **Company** | **Comments** |
| Ericsson | Option 1.  In FR2, considering the beam sweeping, UE may need more time to evaluate the new suitable cell for several possible frequencies. In RedCap, RAN4 had agreed to introduce the beam sweeping factor N1 for eDRX in NR FR2. The timer is T=MAX(10 s, N1 \* eDRX\_IDLE cycle) if eDRX\_IDLE cycle less than 20.48s. From our understanding, UE will face more challenge in DRX scenario than eDRX. |
| Nokia | Initially, our preference is not to make any changes to existing maximum 10s search time. Basically, it can be left for UE implementation to search as many carriers as possible (indicated by the serving cell) within the 10s.  After 10s the UE conclude whether cell selection shall be initiated if the UE has not found any new suitable cell during the 10s. If a cell has been found the need not initiate cell selection.  In some rare configurations this may of course lead to that some carriers may not be searched. However, the requirements do not state that the UE shall search all carriers but states that the UE base the search on configuration information indicated in SIBs:  If the UE in RRC\_IDLE has not found any new suitable cell based on searches and measurements using the intra-frequency, inter-frequency and inter-RAT information indicated in the system information for 10 s, the UE shall initiate cell selection procedures for the selected PLMN as defined in TS 38.304 [1].  However, if the group see a need to clarify and require the UE to search all carriers, then the time may have to be extended as explained in our paper. Currently, we only see that in some NR FR2 scenarios the UE may not be able to search all configured NR FR2 carriers.  In this case we suggest keeping existing requirements and simply extend the search:  Max(10 s, Tidentify\_intra\_without\_index\_FR2 s), where:   * Tidentify\_intra\_without\_index\_FR2 = NNR\_FR2\_carriers x (TPSS/SSS\_sync\_intra\_FR2 + T SSB\_measurement\_period\_intra\_FR2) * NNR\_FR2\_carriers is the number of configured NR FR2 carriers * TPSS/SSS\_sync\_intra\_FR2: For a UE supporting FR2 power class 1 or 5, TPSS/SSS\_sync\_intra\_FR2 =40. For a UE supporting power class 2, TPSS/SSS\_sync\_intra\_FR2 =24. For a UE supporting FR2 power class 3, TPSS/SSS\_sync\_intra\_FR2 =24. For a UE supporting FR2 power class 4, TPSS/SSS\_sync\_intra\_FR2 =24. * T SSB\_measurement\_period\_intra\_FR2 = 8 x SMTC period for the searched NR FR2 carrier |
| Huawei | We are fine with both options.  On option 1, we suggest the following wording update:   * UE ~~can~~ is allowed to extend the search time |
| Ericsson | To Nokia,  This is the Idle mode requirement, why we consider the CONNECTED mode delay? From our understanding, this FR2 delay should be a function of N1 and DRX similar as what we already defined in eDRX.  To Huawei,  After further discuss with other companies, we think current procedure doesn’t mean UE had to search suitable cell for max(10s, [K1]\*N1\*M1\*DRX cycles). UE can stop this procedure before the timer once UE find the suitable cell.  Thus, we suggest to update the proposal as:  **Option 1(Ericsson): RAN4 to introduce the max function for timer T = max(10s, [K1]\*N1\*M1\*DRX cycles), where N1 is defined in Table 4.2.2.2-1, and K1 is 16 if DRX cycle is 0.32s, 8 if DRX cycle is 0.64s, otherwise, K1 = 4.** |
| Qualcomm | We support revised option1 from Ericsson |

### Sub-topic 2-2: Cell Selection in NR-U IDLE mode

*Sub-topic description*

*Open issues and candidate options before e-meeting:*

***Proposal (Ericsson): RAN4 to introduce the max function for timer T = max(10s, M1\*(******P1s +K1)\*DRX cycles) for NR-U, where***

* + ***K1 is 16 if DRX cycle is 0.32s, 8 if DRX cycle is 0.64s, otherwise, K1 = 4.***
  + ***P1s is the number of DRX cycles each with at least one SMTC occasion not available during the TPLMN and P1s ≤ P1s,max.***
  + ***P1s,max = 32 if DRX cycle is 0.32s; 16 if DRX cycle is 0.64s, otherwise, P1s,max = 8.***

***Proposal 3: The UE shall initiate cell selection procedures for the selected PLMN if P1s exceeds P1s,max.***

|  |  |
| --- | --- |
| **Company** | **Comments** |
| MTK | One question for clarification. What does it mean if P1s is not larger than P1s,max?  In our understanding, this means UE finally identified a suitable cell after ( P1s +K1)\*DRX cycles. If UE can already find a suitable cell, UE can go back to normal IDLE operations. If our understanding is correct, it seems we only need to define P1s,max, while P1s becomes redundant. |
| Ericsson | Support the proposals  In NR-U, considering LBT failure, the evaluation time Nserv, Tevaluate may be much larger than 10s which implies the UE will initiate cell selection for the selected PLMN regardless of UE finishing once serving cell and neighbour cell evaluation. Thus, the CCA failure parameter shall be further considered for initiating cell selection procedure in NR-U.  At the same time, we noticed that UE should speed up the measurement once the serving cell quality is worse. Thus, we don’t think UE need to wait the same measurement delay defined in the spec. Once UE failed the evaluation for P1s,max, UE shall initiate cell selection procedures. |
| Apple | We don’t understand how those values comes from.  For example of DRX=0.32s, Tsmtc=20ms:   * In this proposal, if considering the longest T, it is calculated as: T=max (10s, 1\*(32+16)\*0.32)=48\*DRX\_cycle. the UE shall initiate cell selection procedures for the selected PLMN if cannot find suitable cell within 48\*DRX\_cycle. * The intra-frequency cell detection delay in current spec is: (36+Md)\*M2\*DRX\_cycle= (36+Md)\*DRX\_cycle. Md ≤ Md,max=64. The UE shall restart the measurements upon exceeding Md,max (i.e., 100\*DRX\_cycle). * Compared the above two bullet, it shows that UE will not have any chance to restart the cell measurement due to the LBT failure but UE will directly initiate the cell selection of selected PLMN instead. Thus, here are two things we are not convinced:(1) why we disable these thresholds of NR-U by introduce this new T, e.g., Md,max is meaningless and will never be used after introducing new T? (2) what’s the benefit to trigger UE to do cell selection of selected PLMN instead of letting it keep trying on the target frequency layers as defined in existing NR-U requirement?   Thus, in short, we are not against the proposal of new T, but we are not convinced on the values inside T. In our view, T shall be long enough to not impact any previous agreed NR-U threshold. |
| Nokia | Similar comments as for Sub-topic 2-1. |
| Huawei | We suggest to follow the same approach as in sub-topic 2-1, i.e. UE is allowed to extend the search time to T. Depending on implementation, UE may be able to finish search within 10s even it has encountered some LBT failure, so it is not necessary to mandate UE to extend the search time based on LBT.  Another issue is that the definition of “not available” may be a bit unclear. Counting the number of unavailable SMTC/SSB is used to extend the delay in NR-U to allow more time for measurement. We are not sure whether it is reasonable to use here. It is stated that P1s is the number of DRX cycles each with at least one SMTC occasion not available. However, which SMTC UE chooses is up to UE implementation. It means UE may not experience LBT but it is considered as an unavailable DRX cycle. What’s more, UE may perform measurement on multiple carriers, it is ambiguous to say whether it is an unavailable DRX. Different from extension of delay requirements, it seems force UE to keep measure for longer time even UE may not suffer LBT.  Would it be more simple and straightforward if we just enlarge K1 for NR-U so to allow UE to extend the search time? We assume this is similar as what MTK suggested above. |
| Ericsson | To MTK,  MTK’s comment looks valid, but from our understanding, P1sis also used to count the LBT failure number. UE will trigger the cell selection if P1s exceeds P1s,max.  To Apple,  We have different understanding on these two procedures.  Our proposal’s pre-condition is UE has evaluated in Nserv\_CCA consecutive DRX cycles that the serving cell does not fulfil the cell selection criterion S, then UE initiates the measurements of all neighbour cells. Here, the pre-condition is UE doesn’t meet the S criterion.   |  |  |  | | --- | --- | --- | | TS38.3045.2.3.2 Cell Selection Criterion The cell selection criterion S is fulfilled when:   |  | | --- | | Srxlev > 0 AND Squal > 0 |   where:   |  | | --- | | Srxlev = Qrxlevmeas – (Qrxlevmin + Qrxlevminoffset )– Pcompensation - Qoffsettemp  Squal = Qqualmeas – (Qqualmin + Qqualminoffset) - Qoffsettemp | |   For intra-frequency measurement, the pre-condition to trigger the measurement is defined in TS38.304 also. This pre-condition is obviously relaxed.   |  | | --- | | 5.2.4.2 Measurement rules for cell re-selection Following rules are used by the UE to limit needed measurements:  - If the serving cell fulfils Srxlev> SIntraSearchP and Squal > SIntraSearchQ, the UE may choose not to perform intra-frequency measurements.  - Otherwise, the UE shall perform intra-frequency measurements. |   Especially, current scenario we’re talking about is ‘UE has evaluated in Nserv\_CCA consecutive DRX cycles that the serving cell does not fulfil the cell selection criterion S’. From our understanding, the serving cell’s quality is very poorer than normal scenario. That’s the reason we suggest to consider a stringent condition to trigger the cell selection other than performing normal intra-frequency measurement. Anyway, we’re open to further discuss the detail values for P1s,max.  To Nokia,  From our understanding, this is the NR-U issue for FR1 other than a FR2 issue. We need to think the LBT failure impact.  To Huawei,  After further discuss with other companies, we think current procedure doesn’t mean UE had to search suitable cell till the timer expired. UE can come back to normal measurement mode once UE finds the suitable cell. The timer is the maximum value for the worst case.  To simplify the equation, we think M1 can be deleted.  ***Proposal (Ericsson): RAN4 to introduce the max function for timer T = max(10s, ~~M1\*~~(******P1s +K1)\*DRX cycles) for NR-U, where***   * + ***K1 is 16 if DRX cycle is 0.32s, 8 if DRX cycle is 0.64s, otherwise, K1 = 4.***   + ***P1s is the number of DRX cycles each with at least one SMTC occasion not available during the TPLMN and P1s ≤ P1s,max.***   + ***P1s,max = 32 if DRX cycle is 0.32s; 16 if DRX cycle is 0.64s, otherwise, P1s,max = 8.***   ***The UE shall initiate cell selection procedures for the selected PLMN if P1s exceeds P1s,max.*** |
| Qualcomm | We think 10s is sufficient. We don’t think the scenario is suitable as high number of LBT failure as it implies cell is not available. |

### CRs/TPs comments collection

*Major close to finalize WIs and Rel-15 maintenance, comments collections can be arranged for TPs and CRs. For Rel-16 on-going WIs, suggest to focus on open issues discussion on 1st round.*

|  |  |  |  |
| --- | --- | --- | --- |
| **CR/TP number** | **Title** | **Company** | **Comments collection** |
| [**R4-2212763**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2212763.zip) | CR on cell reselection in Idle mode | Ericsson | Nokia: it will depend on the discussion on sub-topic 2-1, our comments provided in sub-topic 2-1. |
| Huawei: pending on issue 2-1. |
|  |
| [**R4-2212764**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2212764.zip) | CR on cell selection in Idle mode for NR-U | Ericsson | MTK: Please check our comment in Sub-topic 2-2. |
| Nokia: it will depend on the discussion on sub-topic 2-2, our comments in sub-topic 2-1 are applied for sub-topic 2-2. |
| Huawei: pending on issue 2-2. |
| [**R4-2212876**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2212876.zip) | CR Correction for suitable cell search in Idle mode | Nokia, Nokia Shanghai Bell | Huawei: pending on issue 2-1. |
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## Summary for 1st round

### Open issues

*Moderator tries to summarize discussion status for 1st round, list all the identified open issues and tentative agreements or candidate options and suggestion for 2nd round i.e. WF assignment.*

|  |  |
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|  | **Status summary** |
| **Sub-topic 2-1: Cell Selection in IDLE mode FR2** | *Option 1(Ericsson): Ericsson, Huawei, Ericsson*  Option 2(Nokia): Nokia, Huawei  Recommend to continue the discussion on revised proposals in 2nd round  Revised option 1: **Option 1(Ericsson): RAN4 to introduce the max function for timer T = max(10s, [K1]\*N1\*M1\*DRX cycles), where N1 is defined in Table 4.2.2.2-1, and K1 is 16 if DRX cycle is 0.32s, 8 if DRX cycle is 0.64s, otherwise, K1 = 4.**  **If UE hasn’t found any suitable cell during 10s, UE can extend the search time to T = max(10s, [K1]\*N1\*M1\*DRX cycles).**  **Option 2 (Nokia):** Max(10 s, Tidentify\_intra\_without\_index\_FR2 s), where:   * Tidentify\_intra\_without\_index\_FR2 = NNR\_FR2\_carriers x (TPSS/SSS\_sync\_intra\_FR2 + T SSB\_measurement\_period\_intra\_FR2) * NNR\_FR2\_carriers is the number of configured NR FR2 carriers * TPSS/SSS\_sync\_intra\_FR2: For a UE supporting FR2 power class 1 or 5, TPSS/SSS\_sync\_intra\_FR2 =40. For a UE supporting power class 2, TPSS/SSS\_sync\_intra\_FR2 =24. For a UE supporting FR2 power class 3, TPSS/SSS\_sync\_intra\_FR2 =24. For a UE supporting FR2 power class 4, TPSS/SSS\_sync\_intra\_FR2 =24. * T SSB\_measurement\_period\_intra\_FR2 = 8 x SMTC period for the searched NR FR2 carrier |
| Sub-topic 2-2: Cell Selection in NR-U IDLE mode | *No consensus has been reached. Continue the discussion in 2nd round* |

### CRs/TPs

*Moderator tries to summarize discussion status for 1st round and provided recommendation on CRs/TPs Status update suggestion*

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| --- | --- |
| **CR/TP number** | **CRs/TPs Status update recommendation** |
| XXX | *Based on 1st round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |

## Discussion on 2nd round (if applicable)

*Moderator can provide summary of 2nd round here. Note that recommended decisions on tdocs should be provided in the section titled ”Recommendations for Tdocs”.*

### Sub-topic 2-1-2r: Cell Selection in IDLE mode FR2

**Revised option 1:** (Ericsson): RAN4 to introduce the max function for timer T = max(10s, [K1]\*N1\*M1\*DRX cycles), where N1 is defined in Table 4.2.2.2-1, and K1 is 16 if DRX cycle is 0.32s, 8 if DRX cycle is 0.64s, otherwise, K1 = 4.

If UE hasn’t found any suitable cell during 10s, UE is allowed to extend the search time to T = max(10s, [K1]\*N1\*M1\*DRX cycles).

**Revised Option 2 (Nokia):** Max(10 s, Tidentify\_intra\_without\_index\_FR2 s), where:

* Tidentify\_intra\_without\_index\_FR2 = NNR\_FR2\_carriers x (TPSS/SSS\_sync\_intra\_FR2 + T SSB\_measurement\_period\_intra\_FR2)
* NNR\_FR2\_carriers is the number of configured NR FR2 carriers
* TPSS/SSS\_sync\_intra\_FR2: For a UE supporting FR2 power class 1 or 5, TPSS/SSS\_sync\_intra\_FR2 =40. For a UE supporting power class 2, TPSS/SSS\_sync\_intra\_FR2 =24. For a UE supporting FR2 power class 3, TPSS/SSS\_sync\_intra\_FR2 =24. For a UE supporting FR2 power class 4, TPSS/SSS\_sync\_intra\_FR2 =24.
* T SSB\_measurement\_period\_intra\_FR2 = 8 x SMTC period for the searched NR FR2 carrier

|  |  |
| --- | --- |
| **Company** | **Comments** |
| Ericsson | We support option 1 with Huawei’s suggestion in 1st round. |
| Qualcomm | We support option 1 |
| Nokia | We would like to raise our concern on the CR and the changes. As we have discussed we do not see that DRX is applicable while UE is searching for cell under the given conditions:  *If the UE has evaluated according to Table 4.2.2.2-1 in Nserv consecutive DRX cycles that the serving cell does not fulfil the cell selection criterion S, the UE shall initiate the measurements of all neighbour cells indicated by the serving cell, regardless of the measurement rules currently limiting UE measurement activities.*  Based on the discussion in the first round we think the discussion could benefit from having a discussion on the following issues which we have identified:   1. Current requirements regarding the suitable cell search time? 2. How to possibly adopt the Tsearch when/if needed? 3. How to account LBT for NR-U |
| MTK | We do not have strong view on this issue, but just want to provide a comment to Nokia regarding whether to use DRX.  In our view, the DRX cycles used in IDLE mode requirement is just to specify the time duration for UE. It has nothing to do with the real UE behavior, e.g., wake up once for each DRX cycle. UE can wake more frequently or less frequently than the DRX cycle for measurement, as long as UE can meet the requirement (or pass the test cases). |
| Huawei | We are in general ok with option 1.  We have no strong view on how to define T. We can also understand the point raised by Nokia, and we share similar view as MTK that the actual UE measurement is not necessarily based on DRX cycle or SMTC period. In this sense, we can either define T based on DRX cycle or SMTC. |

### Sub-topic 2-2-2r: Cell Selection in NR-U IDLE mode

*Sub-topic description*

*Open issues and candidate options before e-meeting:*

***Proposal (Ericsson): RAN4 to introduce the max function for timer T = max(10s, M1\*(******P1s +K1)\*DRX cycles) for NR-U, where***

* + ***K1 is 16 if DRX cycle is 0.32s, 8 if DRX cycle is 0.64s, otherwise, K1 = 4.***
  + ***P1s is the number of DRX cycles each with at least one SMTC occasion not available during the TPLMN and P1s ≤ P1s,max.***
  + ***P1s,max = [32] if DRX cycle is 0.32s; [16] if DRX cycle is 0.64s, otherwise, P1s,max = [8].***

If UE hasn’t found any suitable cell during 10s, UE is allowed to extend the search time to T = max(10s, M1\*( P1s +K1)\*DRX cycles).

***Proposal 3: The UE shall initiate cell selection procedures for the selected PLMN if P1s exceeds P1s,max.***

|  |  |
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| **Company** | **Comments** |
| Ericsson | We support the proposal with Huawei’s suggestion in 1st round. |
| Apple | We think the triggering condition of neighbor cell measurement is not only because of serving cell cannot meet S criteria, but also can be the followings for NR-U:  UE shall initiate measurements on neighbour cells indicated by the serving cell if it is unable to measure on the serving cell for at least N1\*Mp consecutive number of DRX cycles each with at least one SMTC occasion not available at the UE, where Mp=4 when DRX cycle length <1.28 s, Mp=2 when DRX cycle length ≥1.28 s.  So, as we commented in the 1st round, it’s hard to say which way is better for UE and network, i.e., trigger cell selection as early as possible or let UE keep/restart measurement.  We suggest to keep P1s,max as TBD in this meeting. |
| Qualcomm | We don’t support this proposal. As we commented in 1st round, 10s is sufficient for NR-U case. We think multiple number of LBT failure scenario is not expected for cell selection for NR-U. |
| Nokia | We would like to raise our concern on the CR and the changes. As we have discussed we do not see that DRX is applicable while UE is searching for cell under the given conditions:  *If the UE has evaluated according to Table 4.2.2.2-1 in Nserv consecutive DRX cycles that the serving cell does not fulfil the cell selection criterion S, the UE shall initiate the measurements of all neighbour cells indicated by the serving cell, regardless of the measurement rules currently limiting UE measurement activities.*  Based on the discussion in the first round we think the discussion could benefit from having a discussion on the following issues which we have identified:   1. Current requirements regarding the suitable cell search time? 2. How to possibly adopt the Tsearch when/if needed? 3. How to account LBT for NR-U |
| MTK | Our concern for this proposal is that it is too complicated with some redundant parameters. In our understanding, we only need use ***P1s,max*** in the equation. ***P1s*** and K1 are redundant. |
| Huawei | We are in general ok with option 1, but as commented in first round, since the intention is allow UE to search cells for reselection for a longer time, we understand keeping only P1s,max in T may be sufficient. We are fine to leave the exact value for P1s,max as TBD.  On how to define T, we have same comments as for the previous issue. |

### CRs/TPs comments collection

*Major close to finalize WIs and Rel-15 maintenance, comments collections can be arranged for TPs and CRs. For Rel-16 on-going WIs, suggest to focus on open issues discussion on 1st round.*

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| --- | --- | --- | --- |
| **CR/TP number** | **Title** | **Company** | **Comments collection** |
| **[R4-2212763](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2212763.zip)** | CR on cell reselection in Idle mode | Ericsson | Nokia: it will depend on the discussion on sub-topic 2-1, our comments provided in sub-topic 2-1. |
| Huawei: pending on issue 2-1. |
| Nokia (2nd round): it will depend on the discussion on sub-topic 2-1-2r. |
| **[R4-2212764](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2212764.zip)** | CR on cell selection in Idle mode for NR-U | Ericsson | MTK: Please check our comment in Sub-topic 2-2. |
| Nokia: it will depend on the discussion on sub-topic 2-2, our comments in sub-topic 2-1 are applied for sub-topic 2-2. |
| Huawei: pending on issue 2-2. |
| Nokia (2nd round): it will depend on the discussion on sub-topic 2-2-2r. |
| **[R4-2212876](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2212876.zip)** | CR Correction for suitable cell search in Idle mode | Nokia, Nokia Shanghai Bell | Huawei: pending on issue 2-1. |
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## Summary for 2nd round

**Revised option 1:** (Ericsson, Qualcomm,Huawei): RAN4 to introduce the max function for timer T = max(10s, [K1]\*N1\*M1\*DRX cycles), where N1 is defined in Table 4.2.2.2-1, and K1 is 16 if DRX cycle is 0.32s, 8 if DRX cycle is 0.64s, otherwise, K1 = 4.

If UE hasn’t found any suitable cell during 10s, UE is allowed to extend the search time to T = max(10s, [K1]\*N1\*M1\*DRX cycles).

**Revised Option 2 (Nokia):** Max(10 s, Tidentify\_intra\_without\_index\_FR2 s), where:

* Tidentify\_intra\_without\_index\_FR2 = NNR\_FR2\_carriers x (TPSS/SSS\_sync\_intra\_FR2 + T SSB\_measurement\_period\_intra\_FR2)
* NNR\_FR2\_carriers is the number of configured NR FR2 carriers
* TPSS/SSS\_sync\_intra\_FR2: For a UE supporting FR2 power class 1 or 5, TPSS/SSS\_sync\_intra\_FR2 =40. For a UE supporting power class 2, TPSS/SSS\_sync\_intra\_FR2 =24. For a UE supporting FR2 power class 3, TPSS/SSS\_sync\_intra\_FR2 =24. For a UE supporting FR2 power class 4, TPSS/SSS\_sync\_intra\_FR2 =24.
* T SSB\_measurement\_period\_intra\_FR2 = 8 x SMTC period for the searched NR FR2 carrier

# Topic #3: General approach to develop R17 FR1/LTE+FR2 test cases

*Main technical topic overview. The structure can be done based on sub-agenda basis.*

## Companies’ contributions summary

|  |  |  |  |
| --- | --- | --- | --- |
| **T-doc number** | **Title** | **Company** | **Proposals / Observations** |
| [**R4-2213937**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2213937.zip) | General approach to develop R17 FR1/LTE+FR2 test cases | Ericsson | Proposal 1: RAN4 to introduce FR1+FR2 test cases for the Rel-17 WIs and future releases WI and define the applicability rule for the introduced FR1+FR2 test cases. |

## Open issues summary

*Before e-Meeting, moderators shall summarize list of open issues, candidate options and possible WF (if applicable) based on companies’ contributions*

In some of the Rel-17 WI (e.g., FeMIMO/MRDC/71 GHz/UE PS/FeRRM), while defining test cases, RAN4 was discussing how to deal with FR1+FR2 test cases since FR1+FR2 is not presently testable. In FeRRM work item *following* three options were discussed on how to deal FR1+FR2 test cases.

***Test cases design principle - FR1+FR2 test cases***

* *Option 1: Test case design is delayed until testability issues are solved*
* *Option 2: Introduce the test case and define the applicability*
* *Option 3: Do not introduce the test*

### Sub-topic 3-1: FR1/LTE+FR2 test cases in R17

*Sub-topic description*

*Open issues and candidate options before e-meeting:*

* ***Proposal(Ericsson):*** RAN4 to introduce FR1+FR2 test cases for the Rel-17 WIs and future releases WI and define the applicability rule for the introduced FR1+FR2 test cases.

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| **Company** | **Comments** |
| MTK | We support Option 1 or 3.  We prefer not to waste RAN4 effort on TC which still have testability uncertainties. Moreover, even with applicability rule added, the spec readability is still compromised, leading to confusions to the testing guys. |
| Ericsson | We support the proposal. (option 2)  When the testability issue is resolved it will be too much of work to add all the FR1+FR2 test cases. The way we see is anyway UE do not need to perform FR1+FR2 till the testability issue is resolved. The amount of the workload adding additional tests now is much less compared to the work load of adding all the tests at later point of time. |
| Qualcomm | We support the proposal (Option 2) same reason as Ericsson. |
| Apple | We support option 1 or 3. We can add those test cases in the future release when the testability issue is addressed, otherwise we don’t understand why we increase the spec pages at this moment by introducing those untestable TCs. |
| Nokia | While we have 3 options, we agree that in practice option 1 and 3 are pretty much the same. If RAN4 apply either option 1 or option 3 we believe RAN4 will introduce a kind of a chicken and egg problem. Hence, RAN4 does not introduce these tests until testability issue is solved while there is no real reason to address the testability because there are no RAN4 tests.  In that sense we can support option 2. |
| Huawei | We prefer option 2. The workload of adding all FR1+FR2 test cases from different release/WIs is heavy and the discussion about test case list will be difficult. |

### CRs/TPs comments collection

*Major close to finalize WIs and Rel-15 maintenance, comments collections can be arranged for TPs and CRs. For Rel-16 on-going WIs, suggest to focus on open issues discussion on 1st round.*

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| --- | --- | --- | --- |
| **CR/TP number** | **Title** | **Company** | **Comments collection** |
|  |  |  | Company A |
| Company B |
|  |
|  |  |  | Company A |
| Company B |
|  |

## Summary for 1st round

### Open issues

*Moderator tries to summarize discussion status for 1st round, list all the identified open issues and tentative agreements or candidate options and suggestion for 2nd round i.e. WF assignment.*

|  |  |
| --- | --- |
|  | **Status summary** |
| Sub-topic 3-1: FR1/LTE+FR2 test cases in R17 | * *Option 1: Test case design is delayed until testability issues are solved*   + *MTK, apple* * *Option 2: Introduce the test case and define the applicability*   + *Ericsson, Qualcomm, Nokia, Huawei* * *Option 3: Do not introduce the test*   + *MTK, apple*   *Recommendation: Introduce the test case and define the applicability* |

### CRs/TPs

*Moderator tries to summarize discussion status for 1st round and provided recommendation on CRs/TPs Status update suggestion*

|  |  |
| --- | --- |
| **CR/TP number** | **CRs/TPs Status update recommendation** |
| XXX | *Based on 1st round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |

## Discussion on 2nd round (if applicable)

*Moderator can provide summary of 2nd round here. Note that recommended decisions on tdocs should be provided in the section titled ”Recommendations for Tdocs”.*

### Sub-topic 3-1-2r: FR1/LTE+FR2 test cases in R17

* ***Proposal:*** RAN4 to introduce FR1+FR2 test cases for the Rel-17 WIs and future releases WI and define the applicability rule for the introduced FR1+FR2 test cases.

|  |  |
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| **Company** | **Comments** |
| Ericsson | We support the proposal as per the motivation provided in our paper and first round comments. |
| Apple | We can compromise to the proposal. |
| Nokia | We support the proposal, the applicability rules will be updated when testability study for FR1+FR2 progress. |
| Huawei | We can support the proposal |

## Summary for 2nd round

* ***Proposal:*** RAN4 to introduce FR1+FR2 test cases for the Rel-17 WIs and future releases WI and define the applicability rule for the introduced FR1+FR2 test cases.

# Topic #4: on number of serving carriers in SA

*Main technical topic overview. The structure can be done based on sub-agenda basis.*

## Companies’ contributions summary

|  |  |  |  |
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| **T-doc number** | **Title** | **Company** | **Proposals / Observations** |
| [**R4-2212856**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2212856.zip) | Discussion on suitable cell search in Idle mode and number of serving carriers in SA | Nokia, Nokia Shanghai Bell | In RAN4#103e meeting, another issue on number of serving carriers in SA has been discussed and captured in the email discussion summary [5]. In this paper we also discussed this issue and provide our proposals as below:   1. The supported numbers of serving carriers for NR SA should be defined as exact value 2. In Rel-17, it is up to 16 NR DL CCs in NR SA |

## Open issues summary

*Before e-Meeting, moderators shall summarize list of open issues, candidate options and possible WF (if applicable) based on companies’ contributions.*

### Sub-topic 4-1: On number of serving CC in SA

*Sub-topic description*

*Open issues and candidate options before e-meeting:*

* Proposal (Nokia):
  + The supported numbers of serving carriers for NR SA should be defined as exact value
  + In Rel-17, it is up to 16 NR DL CCs in NR SA

|  |  |
| --- | --- |
| **Company** | **Comments** |
| Ericsson | Support the proposal. |
| Qualcomm | Support the proposal |
| Nokia | In RRM requirements, exact value for supported numbers of serving carriers will make the specification clear and readable. Anyone who read the RRM requirements, he/she will get the supported number of serving carriers directly. Since the supported numbers will follow the RF specification, RRM part can check and update requirements for the supported number of CCs according to RF specification at the late phase of release since RF requirements will get more stable at that time. |
| Huawei | We are fine with the proposal. |

### CRs/TPs comments collection

*Major close to finalize WIs and Rel-15 maintenance, comments collections can be arranged for TPs and CRs. For Rel-16 on-going WIs, suggest to focus on open issues discussion on 1st round.*

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| **CR/TP number** | **Title** | **Company** | **Comments collection** |
| [**R4-2212857**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2212857.zip) | CR on Number of serving carriers in SA | Nokia, Nokia Shanghai Bell | Ericsson: OK |
| Qualcomm : OK with CR |
| Company B |
| [**R4-2213936**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2213936.zip) | Number of DL CCs in FR2 for NE-DC | Ericsson | Nokia: The CR title “number of DL CCs in FR2 for NE-DC” is not correct since the content is for SA. The change in the CR is fine and same as Nokia's R4-2212857. |
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## Summary for 1st round

### Open issues

*Moderator tries to summarize discussion status for 1st round, list all the identified open issues and tentative agreements or candidate options and suggestion for 2nd round i.e. WF assignment.*

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| --- | --- |
|  | **Status summary** |
| On number of serving CC in SA | *Tentative agreements:*   * + The supported numbers of serving carriers for NR SA should be defined as exact value   + In Rel-17, it is up to 16 NR DL CCs in NR SA |

### CRs/TPs

*Moderator tries to summarize discussion status for 1st round and provided recommendation on CRs/TPs Status update suggestion*

|  |  |
| --- | --- |
| **CR/TP number** | **CRs/TPs Status update recommendation** |
| XXX | *Based on 1st round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |

## Discussion on 2nd round (if applicable)

*Moderator can provide summary of 2nd round here. Note that recommended decisions on tdocs should be provided in the section titled ”Recommendations for Tdocs”.*

# Topic #5: Miscellaneous CR

*Main technical topic overview. The structure can be done based on sub-agenda basis.*

### CRs/TPs comments collection

*Major close to finalize WIs and Rel-15 maintenance, comments collections can be arranged for TPs and CRs. For Rel-16 on-going WIs, suggest to focus on open issues discussion on 1st round.*

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| --- | --- | --- | --- |
| **CR/TP number** | **Title** | **Company** | **Comments collection** |
| [**R4-2211954**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2211954.zip) | Correction on Measurements of inter-frequency NR cells | Xiaomi | Apple: technically correct. However, there is another CR R4-2213015 addressing this issue under thread#205: R17 FR1 HST. |
| Ericsson: Similar comment as Apple |
| Qualcomm : It is overlapped with R4-2213015 in thread [205]. We suggest to merge and discuss in [205] |
| Nokia: The change is fine. Similar comments as other companies. |
| [**R4-2214072**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2214072.zip) | Editorial clean-up | Qualcomm Incorporated | Apple: this is a 38101 CR. It should be handled in RF session. |
| Ericsson: Same view as Apple. |
| Nokia: same view as Apple and Ericsson. It should be handled in RF session |

## Summary for 1st round

### Open issues

*Moderator tries to summarize discussion status for 1st round, list all the identified open issues and tentative agreements or candidate options and suggestion for 2nd round i.e. WF assignment.*

|  |  |
| --- | --- |
|  | **Status summary** |
| **Sub-topic#1** | *Tentative agreements:*  *Candidate options:*  *Recommendations for 2nd round:* |

### CRs/TPs

*Moderator tries to summarize discussion status for 1st round and provided recommendation on CRs/TPs Status update suggestion*

|  |  |
| --- | --- |
| **CR/TP number** | **CRs/TPs Status update recommendation** |
| XXX | *Based on 1st round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |

## Discussion on 2nd round (if applicable)

*Moderator can provide summary of 2nd round here. Note that recommended decisions on tdocs should be provided in the section titled ”Recommendations for Tdocs”.*

# Recommendations for Tdocs

## 1st round

**New tdocs**

|  |  |  |  |
| --- | --- | --- | --- |
| **New Tdoc number** | **Title** | **Source** | **Comments** |
|  | WF on number of serving carriers in SA | Nokia |  |
|  | LS on … | ZZZ | To: RAN\_X; Cc: RAN\_Y |
|  |  |  |  |

**Existing tdocs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation** | **Comments** |
| **[R4-2213749](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2213749.zip)** | Formal CR to 38.133: Corrections on MUSIM gaps | MediaTek inc. | Agreeable, |  |
| **[R4-2212030](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2212030.zip)** | CR to MUSIM gap configuration for MUSIM requirements applicability | OPPO | Continue the discussion in 2nd round |  |
| **[R4-2212686](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2212686.zip)** | Correction of UE behavior outside gaps | Nokia, Nokia Shanghai Bell | Continue the discussion in 2nd round |  |
| **[R4-2212763](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2212763.zip)** | CR on cell reselection in Idle mode | Ericsson | Continue the discussion in 2nd round |  |
| **[R4-2212764](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2212764.zip)** | CR on cell selection in Idle mode for NR-U | Ericsson | Continue the discussion in 2nd round |  |
| **[R4-2212876](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2212876.zip)** | CR Correction for suitable cell search in Idle mode | Nokia, Nokia Shanghai Bell | Continue the discussion in 2nd round |  |
| **[R4-2212857](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2212857.zip)** | CR on Number of serving carriers in SA | Nokia, Nokia Shanghai Bell | agreeable |  |
| **[R4-2213936](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2213936.zip)** | Number of DL CCs in FR2 for NE-DC | Ericsson | Merged with R4-2212857 |  |
| **[R4-2211954](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2211954.zip)** | Correction on Measurements of inter-frequency NR cells | Xiaomi | Merged with R4-2213015 in [205] |  |
| **[R4-2214072](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2214072.zip)** | Editorial clean-up | Qualcomm Incorporated | Move to RF session |  |

Notes:

1. Please include the summary of recommendations for all tdocs across all sub-topics incl. existing and new tdocs.
2. For the Recommendation column please include one of the following:
   1. CRs/TPs: Agreeable, Revised, Merged, Postponed, Not Pursued
   2. Other documents: Agreeable, Revised, Noted
3. For new LS documents, please include information on To/Cc WGs in the comments column
4. Do not include hyper-links in the documents

## 2nd round

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Tdoc number** | **Revised to** | **Title** | **Source** | **Recommendation** | **Comments** |
| **[R4-2212030](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2212030.zip)** |  | CR to MUSIM gap configuration for MUSIM requirements applicability | OPPO | noted |  |
| **[R4-2212686](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2212686.zip)** |  | Correction of UE behavior outside gaps | Nokia, Nokia Shanghai Bell | noted |  |
| **[R4-2212763](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2212763.zip)** |  | CR on cell reselection in Idle mode | Ericsson | Return to |  |
| **[R4-2212764](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2212764.zip)** |  | CR on cell selection in Idle mode for NR-U | Ericsson | noted |  |
| **[R4-2212876](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2212876.zip)** |  | CR Correction for suitable cell search in Idle mode | Nokia, Nokia Shanghai Bell | Return to |  |

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