3GPP TSG-RAN WG4 meeting #99-e *R4-210xxxx*

Electronic Meeting, 19th – 27th May 2021

**Agenda item:** 6.1.5

**Source:** Moderator (Ericsson)

**Title:** Email discussion summary for [99-e][209] NR\_unlic\_RRM\_1

**Document for:** Information

# Introduction

The discussion covers NR-U AIs within 6.1.5.

**When updating this document, please remember to:**

* **use track changes while adding your comments in this document (only updates marked with change marks will be taken into the next version),**
* **change the file name, adding your company name, according to the instructions from RAN4 chair:**
* **Length of file names shall be reduced, e.g.**
  + **At the beginning of first round, moderators share / ftp / tsg\_ran / WG4\_Radio / TSGR4\_98\_e / Inbox / Drafts / [98e][101] NR\_NewRAT\_SysParameters\Summary\_101\_1st round\_v01.docx**
  + **After update by company A: Summary\_101\_1st round\_v02\_companyA**
  + **After update by company B: Summary\_101\_1st round\_v03\_companyA\_companyB**
  + **After update by company C: Summary\_101\_1st round\_v04\_companyB\_companyC**

## 1st round

The following list of open issues was identified, based on the contributions, for the 1st round.

The following colour marking is used below:

* A topic/issue proposed for discussion in: GTW session 1
* No discussion in the 1st round
* **Topic #1: General (AI 6.1.5.1)**

Sub-topic 1-1: Availability of SSB occasions for CBD

Issue 1-1-1: Availability of SSB occasions for CBD

* **Topic #2: RRC connection mobility control (AI 6.1.5.2)**
* **Topic #3: SCell activation/deactivation (delay and interruption) (AI 6.1.5.3)**

Sub-topic 3-1: Interruptions

Issue 3-1-1: Intra-band CA

Issue 3-1-2: Inter-band CA where victims on inter-band CCs and intra-band CCs interruptions and target SCell is unknown

Issue 3-1-3: Inter-band CA regardless of whether the victim cell is on an intra-band or inter-band CC and target SCell is known

* **Topic #4: Timing (AI 6.1.5.9)**

Sub-topic 4-1: DRX impact on timing

Issue 4-1-1: Definition of the reference cell which is not available, with respect to DRX

Sub-topic 4-2: Measurement gaps impact on timing

Issue 4-2-1: Definition of the reference cell which is not available, with respect to MGs

* **Topic #5: Endorsed CRs (AI 6.1.5 and AI 6.1.5.3)**

## 2nd round

TBD

# Topic #1: General

Contributions from AI 6.1.5.1 are discussed here.

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2108759 | ZTE Corporation | **Observation 1:** The current requirement in TS 38.133 requires the UE to determine the availability of SSB more frequent than than once per P\*DRX cycle length when DRX cycle is larger than 320 ms.   1. UE should determine the availability of SSB more frequent than than once per P\*DRX cycle length when DRX cycle is larger than 320 ms. |
| R4-2109416 | Nokia, Nokia Shanghai Bell | CR: Terminology update for NR-U |
| R4-2110780 | Ericsson | **Proposal:** For CBD, the UE is not required to determine the availability of SSB occasions more frequent than:   * Once per Max(25ms, DRX\_cycle\_length, TSSB) if DRX\_cycle\_length ≤ 320ms * Once per DRX\_cycle\_length if DRX\_cycle\_length > 320ms. |
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## Open issues summary

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

Background:

The way forward from last meeting contains following open issue related CBD [R4-2105700]:

|  |
| --- |
| * For CBD   + FFS whether the UE is not required to determine the availability of SSB occasions more frequent than once per P\*DRX cycle length when configured with DRX. |

### Sub-topic 1-1: Availability of SSB occasions for CBD

**Issue 1-1-1: Availability of SSB occasions for CBD**

* Proposal 1 (ZTE Corporation):
  + UE should determine the availability of SSB more frequent than than once per P\*DRX cycle length when DRX cycle is larger than 320 ms.
* Proposal 2 (Ericsson):
  + For CBD, the UE is not required to determine the availability of SSB occasions more frequent than:
    - Once per Max(25ms, DRX\_cycle\_length, TSSB) if DRX\_cycle\_length ≤ 320ms
    - Once per DRX\_cycle\_length if DRX\_cycle\_length > 320ms.
* Recommended WF
  + Discuss the proposal

## Companies views’ collection for 1st round

### Open issues

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| --- | --- |
| **Company** | **Comments** |
| Apple | **Issue 1-1-1: Availability of SSB occasions for CBD**  We propose a new option 3 here based on the measurement interval in current CBD requirement. The P factor shall be considered since UE would not perform CBD in MG duration.  Option 3 (Apple):   * + For CBD, the UE is not required to determine the availability of SSB occasions more frequent than:     - Once per Max(25ms, P\* TSSB) if DRX\_cycle\_length ≤ 320ms     - Once per P\*DRX\_cycle\_length if DRX\_cycle\_length > 320ms. |
| Qualcomm | **Issue 1-1-1: Availability of SSB occasions for CBD**  We think the factor P needs to be considered. Apple’s proposal looks fine to us. One minor editorial comment is that we can, perhaps, use TDRX instead of DRX\_cycle\_length to be consistent with the naming. |
| MTK | Agree with Apple and Qualcomm. In addition, besides CBD, the factor P needs to be considered also for RLM/BFD/L1-RSRP when measurement gap is configured.  Thus, we propose to update proposal 3 as below:  Proposal 3a (revised from proposal 3)   * + For CBD, the UE is not required to determine the availability of SSB occasions more frequent than:     - Once per Max(25ms, P\*TSSB) if DRX\_cycle\_length ≤ 320ms or no DRX     - Once per P\*TDRX if DRX\_cycle\_length > 320ms.   + For RLM/BFD/L1-RSRP, the P factor should also be considered. |
| Ericsson | We can accept to include P as a compromise, thus option 3 proposed by Apple is acceptable to us. |
| ZTE | Can support Option 3. |

### 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** | **Comments collection** |
| R4-2109416 (Nokia, Nokia Shanghai Bell ) | Ericsson: This CR is fine to us. |
| 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.*

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| --- | --- |
|  | **Status summary** |
| **Sub-topic 1-1, issue 1-1-1:** | **Issue 1-1-1: Availability of SSB occasions for CBD**  *Tentative agreements:*   * + For CBD, the UE, which is configured in DRX, is not required to determine the availability of SSB occasions more frequent than:     - Once per Max(25ms, P\* TSSB) if TDRX ≤ 320ms     - Once per P\* TDRX if TDRX > 320ms.   FFS whether to consider P factor for RLM/BFD/L1-RSRP.  *Candidate options:*  *Recommendations for 2nd round:*  To capture the agreement for determining of SSB availability for CBD in WF.  Discuss the following:   * FFS whether to consider P factor for RLM/BFD/L1-RSRP. |

### 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 1-2: Considering of P factor in SSB availability for RLM/BFD/L1-RSRP

**Issue 1-2-1: Considering of P factor in SSB availability for RLM/BFD/L1-RSRP**

Background:

For CBD, following agreement is reached in the 1st round that:

* + For CBD, the UE, which is configured in DRX, is not required to determine the availability of SSB occasions more frequent than:
    - Once per Max(25ms, P\* TSSB) if TDRX ≤ 320ms
    - Once per P\* TDRX if TDRX > 320ms.

Proposals

* Proposal 1: Consider P factor in SSB availability for RLM/BFD/L1-RSRP
* Proposal 2: Do not consider P factor in SSB availability for RLM/BFD/L1-RSRP

Recommended WF

* + Discuss the proposals.

## Companies views’ collection for 2nd round

### Open issues

|  |  |
| --- | --- |
| **Company** | **Comments** |
| Apple | **Issue 1-2-1: Considering of P factor in SSB availability for RLM/BFD/L1-RSRP**  Support proposal 1. |
| Qualcomm | **Issue 1-2-1: Considering of P factor in SSB availability for RLM/BFD/L1-RSRP**  Support proposal 1. |
| Huawei | **Issue 1-2-1: Considering of P factor in SSB availability for RLM/BFD/L1-RSRP**  Support option 1 |
| Ericsson | **Issue 1-2-1: Considering of P factor in SSB availability for RLM/BFD/L1-RSRP**  We support proposal 2. It is noted that the SSB availability for RLM was already agreed at last meeting and our preference is to maintain that agreement. The RLM there is already an agreement to define that UE is not required to determine the availability of SSB occasions more frequent than once per L1 indication interval. But such interval does not exist for CBD. For BFD and L1-RSRP, there is no on SSB availability checking. |

# Topic #2: RRC connection mobility control

Contributions from AI 6.1.5.2 are discussed here.

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4- 2111513 | Qualcomm Incorporated | CR: The CR updates clause 6.2.1A.2.1 based on agreements related to SI reading time |

## Open issues summary

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

## Companies views’ collection for 1st round

### Open issues

|  |  |
| --- | --- |
| **Company** | **Comments** |
| Company A |  |

### 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** | **Comments collection** |
| R4-2111513  (Qualcomm Incorporated) | Ericsson: This CR is fine to us. |
| Qualcomm: This CR removes the editor’s note related to TSI-NR. It’s already agreed that the value of TSI-NR would be set in the test-cases. |
|  |
|  | 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 2-1, issue 2-1-1:** | *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”.*

# Topic #3: SCell activation/deactivation (delay and interruption)

Contributions from AI 6.1.5.3 are discussed here.

## Companies’ contributions summary

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| --- | --- | --- |
| T-doc number | Company | Proposals / Observations |
| R4-2108757 | ZTE Corporation | Proposal 1: Additional interruptions are needed for active cells outside the band with the SCell being activated.  Proposal 2: For scenarios with victims on inter-band CCs and intra-band CCs: more than one interruption can be allowed. |
| R4-2109851 | MediaTek Inc. | **Proposal 1:** In Inter-band CA, when the target NR-U SCell is unknown,   * more than one interruption can be allowed on the victims within the band with the SCell being activated * a single interruption applies to any victim cell outside the band with the SCell being activated   **Proposal 2:** In Inter-band CA, when the target NR-U SCell is known with measureCycle > 160 ms,   * more than one interruption can be allowed on the victims within the band with the SCell being activated * a single interruption applies to any victim cell outside the band with the SCell being activated |
| R4-2110306 | Huawei, HiSilicon | **Proposal 1:** For intra-band CA, up to 1+L interruption windows are allowed during SCell activation. The length of up to L interruption windows shall be extended considering the RF tuning.  **Proposal 2:** For inter-band CA where victims on inter-band CCs and intra-band CCs interruptions and target SCell is unknown or when target SCell is known with measurement cycle larger greater than 160 ms, more than one interruptions are allowed. |
| R4-2110307 | Huawei, HiSilicon | CR: On SCell activation and deactivation NR-U R16 |
| R4-2111238 | Ericsson | **Proposal 1:**   * For the known target SCell with measureCycle > 160:   + a single interruption applies, regardless of whether the victim cell is on an intra-band or inter-band CC * For unknown target SCell:   + Scenario with victims on inter-band CCs and intra-band CCs: more than one interruption can be allowed   **Proposal 2:**   * There is no need to extend the interruption time because of DL LBT failure during intra-band SCell activation. No further clarification needed in the spec-text. |
| R4-2111254 | Ericsson | CR: NR-U SCell activiation interruption requirements in 38.133 |
| R4- 2111511 | Qualcomm Inc. | CR: Interruption during Scell activation requirements for SCells operating with CCA |
| R4-2111515 | Qualcomm Inc. | **Observation 1.** When the SCell being activated is known with a measureCycle > 160ms, only fine AGC (DVGA) adjustment is needed. The performance degradation of the intra-band victim SCell is not significant and hence RF re-tuning is not justified at all.  **Proposal 1.** A single interruption applies during inter-band CA regardless of whether the victim cell is on an intra-band or inter-band CC when the target SCell is known.  **Observation 2.** When the SCell being activated is unknown and there is an intra-band victim SCell –   * The performance degradation of the intra-band victim cell is receiver implementation dependent, * A smart UE must not be penalized with throughput degradation, not just on intra-band cells but also on, potentially many, inter-band cells, * The performance degradation of the intra-band victim cell also depends on its frequency separation from the target cell – non-contiguous cells should not encounter any performance degradation * Any power savings due to RF re-tuning are transient and are not acceptable for the throughput degradation caused by multiple interruptions on potentially many (intra/inter-band) cells   **Proposal 2.** No need to consider RF retuning due to DL CCA failures in SCell activation/deactivation requirements.  **Proposal 3**. A single interruption applies to any victim cell outside the band with the (known or unknown) SCell being activated, irrespective of whether any intra-band victim cell is present or not and. No further clarification is needed in the spec text. |

## 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 3-1: Interruptions

**Issue 3-1-1: Interruption length during intra-band CA**

* Proposals 1 (Huawei, HiSilicon):
  + For intra-band CA, up to 1+L interruption windows are allowed during SCell activation. **The length of up to L interruption windows shall be extended considering the RF tuning.**
* Proposal 2 (Qualcomm Incorporated, Ericsson): 
  + There is **no need to extend the interruption time** because of DL LBT failure during intra-band SCell activation. No further clarification needed in the spec-text.
* Recommended WF
  + Discuss the proposal
* **Update after GTW session 2021-05-20:**
  + Agreements:
    - During SCell activation for intra-band CA
      * Additional relaxations apply for the following conditions
        + 1) The scheduled SSB index is the last one in the SSB burst and
        + 2) SMTC duration configured by the network includes two candidate positions for the SSB index
        + 3) CCA failure happens on both candidate positions
      * Candidate relaxations
        + Option 1: Extend the length of interruption window
        + Option 2: Allow a certain performance degradation
        + Option 3: Allow multiple interruptions due to RF tuning
      * Note: the agreement applies at least for unknown SCell activation case
  + Companies are to provide their view on following agreement including options from the GTW session:

**Issue 3-1-2: Inter-band CA where victims on inter-band CCs and intra-band CCs interruptions and target SCell is unknown**

* Proposals 1 (Huawei, HiSilicon, ZTE Corporation) More than one interruptions are allowed on the victim inter-band CCs.
  + 1a: (Huawei, HiSilicon): For inter-band CA where victims on inter-band CCs and intra-band CCs interruptions and target SCell is unknown, more than one interruptions are allowed.
  + 1b (ZTE Corporation, Ericsson): For scenarios with victims on inter-band CCs and intra-band CCs: more than one interruption can be allowed.
* Proposal 2 (Qualcomm Incorporated, Mediatek): A single interruption is allowed on the victim inter-band CCs
  + 1a(Qualcomm) : A single interruption applies to any victim cell outside the band with the (unknown) SCell being activated, irrespective of whether any intra-band victim cell is present or not and. No further clarification is needed in the spec text.
    - No need to consider RF retuning due to DL CCA failures in SCell activation/deactivation requirements.
  + 1b (MediaTek Inc.): A single interruption applies to any victim cell outside the band with the SCell being activated
* Recommended WF
  + Discuss the proposals
* **Update after GTW session 2021-05-20:**
  + Proposals
    - Proposals 1 (Huawei, HiSilicon, ZTE Corporation) More than one interruptions are allowed on the victim inter-band CCs.
      * 1a: (Huawei, HiSilicon): For inter-band CA where victims on inter-band CCs and intra-band CCs interruptions and target SCell is unknown, more than one interruptions are allowed.
      * 1b (ZTE Corporation, ~~Ericsson~~): For scenarios with victims on inter-band CCs and intra-band CCs: more than one interruption can be allowed.
    - Proposal 2 (Qualcomm Incorporated, Mediatek, Ericsson): A single interruption is allowed on the victim inter-band CCs
      * 2a (Qualcomm): A single interruption applies to any victim cell outside the band with the (unknown) SCell being activated, irrespective of whether any intra-band victim cell is present or not and. No further clarification is needed in the spec text.
        + No need to consider RF retuning due to DL CCA failures in SCell activation/deactivation requirements.
      * 2b (MediaTek Inc.): A single interruption applies to any victim cell outside the band with the SCell being activated

**Issue 3-1-3: Inter-band CA regardless of whether the victim cell is on an intra-band or inter-band CC and target SCell is known**

* Proposals 1 (Huawei, HiSilicon, ZTE Corporation): More than one interruptions are allowed on the victim inter-band CCs.
  + 1a: (Huawei, HiSilicon): For inter-band CA where victims on inter-band CCs and intra-band CCs interruptions and when target SCell is known with measurement cycle larger greater than 160 ms, more than one interruptions are allowed.
  + 1b(ZTE Corporation): For scenarios with victims on inter-band CCs and intra-band CCs: more than one interruption can be allowed.
* Proposal 2 (Qualcomm Incorporated, Ericsson, Mediatek):
  + 1a(Qualcomm, Ericsson): A single interruption applies to any victim cell outside the band with the (known) SCell being activated, irrespective of whether any intra-band victim cell is present or not and. No further clarification is needed in the spec text.
    - No need to consider RF retuning due to DL CCA failures in SCell activation/deactivation requirements.
  + 1b (MediaTek Inc.): A single interruption applies to any victim cell outside the band with the SCell being activated
* Recommended WF
  + Discuss the proposals
* **Update after GTW session 2021-05-20:**
  + Continue discussion based on the notes/updated proposals from GTW session as follows:
  + Proposals
    - Proposals 1 (Huawei, HiSilicon, ZTE Corporation): More than one interruptions are allowed on the victim inter-band CCs.
      * 1a: (Huawei, HiSilicon): For inter-band CA where victims on inter-band CCs and intra-band CCs interruptions and when target SCell is known with measurement cycle larger greater than 160 ms, more than one interruptions are allowed.
      * 1b(ZTE Corporation): For scenarios with victims on inter-band CCs and intra-band CCs: more than one interruption can be allowed.
    - Proposal 2 (Qualcomm Incorporated, Ericsson, Mediatek):
      * 1a(Qualcomm, Ericsson): A single interruption applies to any victim cell outside the band with the (known) SCell being activated, irrespective of whether any intra-band victim cell is present or not and. No further clarification is needed in the spec text.
        + No need to consider RF retuning due to DL CCA failures in SCell activation/deactivation requirements.
      * 1b (MediaTek Inc.): A single interruption applies to any victim cell outside the band with the SCell being activated

## Companies views’ collection for 1st round

### Open issues

|  |  |
| --- | --- |
| **Company** | **Comments** |
| Apple | **Issue 3-1-1: Intra-band CA**  Fine with proposal 1  **Issue 3-1-2: Inter-band CA where victims on inter-band CCs and intra-band CCs interruptions and target SCell is unknown**  Fine with proposal 1 – option 1a.  **Issue 3-1-3: Inter-band CA regardless of whether the victim cell is on an intra-band or inter-band CC and target SCell is known**  Fine with proposal 1 – option 1a. |
| Qualacomm | **Issue 3-1-1: Intra-band CA**  Support proposal 2. We still believe additional time is not needed. As we mentioned earlier, taking the entire SMTC duration to detect the LBT failure is a very corner case scenario where  1) The scheduled SSB index is the last one in the SSB burst **and**  2) SMTC duration configured by the network is the shortest which just includes two candidate positions for the SSB index (which is very unlikely to happen) **and**  3) CCA failure happens on **both** the candidate positions (As per discussion in the performance part, the probability of happening this is <10%) implying that the **channel is extremely crowded** (why would a network want to activate a CC in such a busy channel).  Extending the interruption period to handle RF retuning (which is not even agreed yet) for a scenario which, practically, may never occur, is not acceptable. There’s only downside to this proposal as the network throughput would take a hit.  **Issue 3-1-2: Inter-band CA where victims on inter-band CCs and intra-band CCs interruptions and target SCell is unknown**  Support proposal 2 – option 1a.  As mentioned earlier, and in our paper, the performance degradation, if any (we haven’t seen any numbers yet), due to untuned AGC is very much UE implementation dependent. Allowing two additional interruptions per CCA on potentially multiple inter-band victim CCs will cause a major hit to the network throughput. We do not support additional interruptions due to RF retuning.  **Issue 3-1-3: Inter-band CA regardless of whether the victim cell is on an intra-band or inter-band CC and target SCell is known**  Support proposal 2 – option 1a.  Same comment as in issue 3-1-2, we do not support additional interruptions due to RF retuning.  Furthermore, for a known SCell activation case, RF retuning is not justified at all, as only fine AGC tuning may be needed when the measurement cycle > 160ms. This is typically done with a DVGA and there’s absolutely no need to re-tune RF in this case. |
| Huawei | **Issue 3-1-1: Intra-band CA**  We further provide our views based on the progress in GTW Session  Three Options are listed as follows:   * + - * + Option 1: Extend the length of interruption window         + Option 2: Allow a certain performance degradation         + Option 3: Allow multiple interruptions due to RF tuning   Based on the conditions mentioned in the GTW session, it means when the vacant time without SSB monitoring within the SMTC is not sufficient, UE will perform the RF tuning (option 1 the length of interruption window of intra-band CC will be extended), or keep the RF open (option 2, degradation on intra-band serving CC is expected and the interruption window is not extended).  We prefer option 1. The argument about the impact on system throughput is not convincing. What we are defining is the interruption requirements, which means it will not impact the scheduling of NW. For some advanced UE or smart UE to which the RF tuning may be not needed, there is no interruptions and no impact to the throughput. The interruptions on data transmissions only apply to the UE to which the RF tuning is needed.  If we go with option 2, it means for some cases when the RF tuning cannot be done without extending the interruption window, UE will choose to keep the RF open and the degradation on intra-band serving CC is expected. But for other cases when the conditions is not met, UE still need to perform RF tuning to guarantee the performance of the intra-band serving CC.  **Issue 3-1-2: Inter-band CA where victims on inter-band CCs and intra-band CCs interruptions and target SCell is unknown**  We support option 1. Based on the analysis in issue 3-1-1. Even when the interruption length is not extended when UE could choose to turning the RF back within the SMTC, then there are also two RF tuning actions which will lead to two interruptions to inter-band victim CCs. Also the concern about the impact on system throughput is not convincing as it is defined as the interruption requirements not the scheduling restriction. For some smart UE, there will be no interruptions and not throughput loss.  **Issue 3-1-3: Inter-band CA regardless of whether the victim cell is on an intra-band or inter-band CC and target SCell is known**  We kind of agree with the observation that the RF tuning may be not that common for known case. But we prefer to keep align with R15 requirements where the interruption including SMTC duration is allowed also for known cell. |
| Ericsson | **Issue 3-1-1: Interruption length during intra-band CA**  We support option 1 (Option 1: Extend the length of interruption window) under the conditions listed as 1), 2) and 3). If interruptions are allowed, then it should clear and concrete requirements, i.e. when and for how long. Option 2 is quite ambiguous as it does not state the amount of interruption.  **Issue 3-1-2: Inter-band CA where victims on inter-band CCs and intra-band CCs interruptions and target SCell is unknown**  Although we proposed 1b, as a compromise, we can also accept proposal 2 meaning no RF tuning is assumed and thus a single interruption will be applied to the victim cell outside the band.  **Issue 3-1-3: Inter-band CA regardless of whether the victim cell is on an intra-band or inter-band CC and target SCell is known**  For case when target SCell is known which is less challenging than the unknown case, our view is that single interruption is enough as cell is already known and therefore only fune tuning of AGC is needed. |
| Apple2 | Some update on our views for following issues:  **Issue 3-1-1: Interruption length during intra-band CA**  After some offline discussion with companies, we are now fine with either “Option 1: Extend the length of interruption window” or “Option 2: Allow a certain performance degradation”.  **Issue 3-1-2: Inter-band CA where victims on inter-band CCs and intra-band CCs interruptions and target SCell is unknown**  We are fine with proposal 1; but can also accept another option that “Option 3: single interruption on the victim inter-band CCs, but allow a certain performance degradation on the active serving cell in the same band with being-activated unknown SCell”.  **Issue 3-1-3: Inter-band CA regardless of whether the victim cell is on an intra-band or inter-band CC and target SCell is known**  Support proposal 1 but can compromise to proposal 2. |

### 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** | **Comments collection** |
| R4-2110307 (Huawei, HiSilicon) | Ericsson: contain changes that are currently being discussed under issue 3-1-1 to 3-1-3. We propose to wait with the CR until the technical issues are resolved. |
| Company B |
|  |
| R4-2111254 (Ericsson) | Company A |
| Company B |
|  |
| R4- 2111511 (Qualcomm Inc.) | 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** | **Issue 3-1-1: Intra-band CA**  *Tentative agreements:*   * + - During SCell activation for intra-band CA       * The length of the interruption window is extended for the following conditions         + 1) The scheduled SSB index is the last one in the SSB burst and         + 2) SMTC duration configured by the network includes two candidate positions for the SSB index         + 3) CCA failure happens on both candidate positions   *Candidate options:*  *Recommendations for 2nd round:*  To work on the CR and capture the agreement in a WF.  **Issue 3-1-2: Inter-band CA where victims on inter-band CCs and intra-band CCs interruptions and target SCell is unknown**  *Tentative agreements:*  *Candidate options:*   * + Proposals     - Proposals 1 (Huawei, HiSilicon, ZTE Corporation, Apple) More than one interruptions are allowed on the victim inter-band CCs.       * 1a: (Huawei, HiSilicon): For inter-band CA where victims on inter-band CCs and intra-band CCs interruptions and target SCell is unknown, more than one interruptions are allowed.       * 1b (ZTE Corporation, ~~Ericsson~~): For scenarios with victims on inter-band CCs and intra-band CCs: more than one interruption can be allowed.     - Proposal 2 (Qualcomm Incorporated, Mediatek, Ericsson): A single interruption is allowed on the victim inter-band CCs       * 2a (Qualcomm): A single interruption applies to any victim cell outside the band with the (unknown) SCell being activated, irrespective of whether any intra-band victim cell is present or not and. No further clarification is needed in the spec text.         + No need to consider RF retuning due to DL CCA failures in SCell activation/deactivation requirements.       * 2b (MediaTek Inc.): A single interruption applies to any victim cell outside the band with the SCell being activated       * Option 3 (Apple): single interruption on the victim inter-band CCs, but allow a certain performance degradation on the active serving cell in the same band with being-activated unknown SCell”   *Recommendations for 2nd round:*  Continue the discussions based on the candidate options listed above. Since this issue has been ongoing for several meetings, companies are encouraged to seek compromise solutions.  **Issue 3-1-3: Inter-band CA regardless of whether the victim cell is on an intra-band or inter-band CC and target SCell is known**  *Tentative agreements:*  *Candidate options:*   * + Proposals     - Proposals 1 (Huawei, HiSilicon, ZTE Corporation): More than one interruptions are allowed on the victim inter-band CCs.       * 1a: (Huawei, HiSilicon): For inter-band CA where victims on inter-band CCs and intra-band CCs interruptions and when target SCell is known with measurement cycle larger greater than 160 ms, more than one interruptions are allowed.       * 1b(ZTE Corporation): For scenarios with victims on inter-band CCs and intra-band CCs: more than one interruption can be allowed.     - Proposal 2 (Qualcomm Incorporated, Ericsson, Mediatek, Apple):       * 1a(Qualcomm, Ericsson): A single interruption applies to any victim cell outside the band with the (known) SCell being activated, irrespective of whether any intra-band victim cell is present or not and. No further clarification is needed in the spec text.         + No need to consider RF retuning due to DL CCA failures in SCell activation/deactivation requirements.       * 1b (MediaTek Inc., Ericsson): A single interruption applies to any victim cell outside the band with the SCell being activated   *Recommendations for 2nd round:*  Continue the discussions based on the candidate options listed above. Since this issue has been ongoing for several meetings, companies are encouraged to seek compromise solutions. |

### 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”.*

**Issue 3-1-2: Inter-band CA where victims on inter-band CCs and intra-band CCs interruptions and target SCell is unknown**

Proposals

* + Proposals 1 (Huawei, HiSilicon, ZTE Corporation, Apple) More than one interruptions are allowed on the victim inter-band CCs.
    - 1a: (Huawei, HiSilicon): For inter-band CA where victims on inter-band CCs and intra-band CCs interruptions and target SCell is unknown, more than one interruptions are allowed.
    - 1b (ZTE Corporation): For scenarios with victims on inter-band CCs and intra-band CCs: more than one interruption can be allowed.
  + Proposal 2 (Qualcomm Incorporated, Mediatek, Ericsson): A single interruption is allowed on the victim inter-band CCs
    - 2a (Qualcomm): A single interruption applies to any victim cell outside the band with the (unknown) SCell being activated, irrespective of whether any intra-band victim cell is present or not and. No further clarification is needed in the spec text.
      * No need to consider RF retuning due to DL CCA failures in SCell activation/deactivation requirements.
    - 2b (MediaTek Inc.): A single interruption applies to any victim cell outside the band with the SCell being activated
    - 3 (Apple): single interruption on the victim inter-band CCs, but allow a certain performance degradation on the active serving cell in the same band with being-activated unknown SCell”

Recommended WF:

Continue the discussions based on the candidate options listed above. Since this issue has been ongoing for several meetings, companies are encouraged to seek compromise solutions.

**Issue 3-1-3: Inter-band CA regardless of whether the victim cell is on an intra-band or inter-band CC and target SCell is known**

Proposals

* + Proposals 1 (Huawei, HiSilicon, ZTE Corporation): More than one interruptions are allowed on the victim inter-band CCs.
    - 1a: (Huawei, HiSilicon): For inter-band CA where victims on inter-band CCs and intra-band CCs interruptions and when target SCell is known with measurement cycle larger greater than 160 ms, more than one interruptions are allowed.
    - 1b(ZTE Corporation): For scenarios with victims on inter-band CCs and intra-band CCs: more than one interruption can be allowed.
  + Proposal 2 (Qualcomm Incorporated, Ericsson, Mediatek, Apple):
    - 2a(Qualcomm, Ericsson): A single interruption applies to any victim cell outside the band with the (known) SCell being activated, irrespective of whether any intra-band victim cell is present or not and. No further clarification is needed in the spec text.
      * No need to consider RF retuning due to DL CCA failures in SCell activation/deactivation requirements.
    - 2b (MediaTek Inc., Ericsson): A single interruption applies to any victim cell outside the band with the SCell being activated

Recommended WF:

Continue the discussions based on the candidate options listed above. Since this issue has been ongoing for several meetings, companies are encouraged to seek compromise solutions.

## Companies views’ collection for 2nd round

### Open issues

|  |  |
| --- | --- |
| **Company** | **Comments** |
| Apple | **Issue 3-1-2: Inter-band CA where victims on inter-band CCs and intra-band CCs interruptions and target SCell is unknown**  Fine with proposal 1- option 1a and proposal 2 - option 3  **Issue 3-1-3: Inter-band CA regardless of whether the victim cell is on an intra-band or inter-band CC and target SCell is known**  Can compromise to proposal 2. |
| Qualcomm | **Issue 3-1-2: Inter-band CA where victims on inter-band CCs and intra-band CCs interruptions and target SCell is unknown**  We support option 2a. No additional interruptions should be allowed on inter-band CCs.  **Issue 3-1-3: Inter-band CA regardless of whether the victim cell is on an intra-band or inter-band CC and target SCell is known**  Support Proposal 2a. When the target SCell is known, only fine AGC adjustment may be needed and there is absolutely no need for RF re-tuning. |
| Huawei | **Issue 3-1-2: Inter-band CA where victims on inter-band CCs and intra-band CCs interruptions and target SCell is unknown**  Support proposal 1 - option 1a and also fine with proposal 2- option 3.  To clarify the situation here, this issue is related to issue 3-1-1 discussed in the 1st round. If the relaxations go to option 1 (extend the length of interruption window), then we can only support proposal 1 – option 1a as it is assumed UE may perform the RF tuning to guarantee the performance of serving CC within the same band. If the relaxations go to option 2 (Allow a certain performance degradation), then we can support proposal 2 – option 3.  When the conditions in issue 3-1-1 are not met, it is assumed that the SMTC is long enough to cover the first two candidate SSB positions and also leave some margin for UE to perform the RF tuning. Then extending the interruption window for intra-band CC may not needed for this case, but for inter-band victim CCs, more than one interruptions are always needed.  Then for option 3, we would like to clarify that the condition is when L > 0 (L is L2,1 or L3,1), which also apply to issue 3-1-1. Otherwise, we can only agree with option proposal 1 – option 1a.  **Issue 3-1-3: Inter-band CA regardless of whether the victim cell is on an intra-band or inter-band CC and target SCell is known**  Support option 1 but can compromise to proposal 2 provided that the candidate relaxation go to option 2 in issue 3-1-1 (allow a certain performance degradation) and proposal 2 – option 3 in issue 3-1-2. |
| Ericsson | **Issue 3-1-2: Inter-band CA where victims on inter-band CCs and intra-band CCs interruptions and target SCell is unknown**  Based on the above comments, it seems possible to for companies to agree on proposal option 3 as follows:  *“single interruption on the victim inter-band CCs, but allow a certain performance degradation on the active serving cell in the same band with being-activated unknown SCell”*  We would like to understand this option better. We understand that single interruption is allowed on the victim inter-band CC, but what is meant by “certain performance degradation” on the active serving cell is allowed. This is bit ambiguous, requirements should be clear and concrete. If this part can be clarified, then we are fine with this option.  **Issue 3-1-3: Inter-band CA regardless of whether the victim cell is on an intra-band or inter-band CC and target SCell is known**  We are fine with any option of proposal 2. |

# Topic #4: Timing

Contributions from AI 6.1.5.9 are discussed here.

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2108758 | ZTE Corporation | Proposal 1: SSB does not have to be within ON duration in a reference cell subject to DL CCA in order to meet UE timing requirements. No clarification related to DRX is needed on the current definition of unavailability of a reference cell on a carrier frequency subject to CCA in section 7.1.1.  Proposal 2: No clarification related to gap is needed on the current definition of unavailability of a reference cell on a carrier frequency subject to CCA in section 7.1.1.  Proposal 3: Clarification can be captured in the WF if necessary. |
| R4-2109297 | Apple | Proposal 1: the reference cell availability shall be revised as below regardless of DRX status or MG status:  In the requirements of clause 7.1.2, the term reference cell on a carrier frequency subject to CCA is not available at the UE refers to when at least one SSB is configured by gNB, but the first two successive candidate SSB positions for the same SSB index within the discovery burst transmission window are not available for at least one SSB, at the UE due to DL CCA failures at gNB during the last X ms; otherwise the reference cell on the carrier frequency subject to CCA is considered as available at the UE.  • X = 1280ms. |
| R4-2110310 | Huawei, HiSilicon | CR: on timing requirements for NR-U R16 |
| R4-2110309 | Huawei, HiSilicon | **Observation 1:** The 160 ms conditions work for not only the availability of the reference cell but also the Te requirements.  **Proposal 1:** The availability of reference cell shall base on the SSB within the DL active BWP which is not overlapping with measurement gaps. |
| R4-2109298 | Apple, MediaTek, Ericsson | CR: CR on reference cell availability for NR-U R16 |
| R4-2111303 | Ericsson | * **Observation 1:** The necessary condition for meeting Te requirement is that the SSB should be available at the UE at least once every 160 ms. * **Observation 2:** In legacy UE timing requirements the same condition on SSB availability (once every 160 ms) is applicable regardless of whether DRX and/or measurement gaps are configured. * **Observation 3:** There is no technical reason to have different condition on SSB availability for meeting UE timing requirements when reference cell is subject to CCA. * **Observation 4:** For the case when the UE is configured with DRX, in principle no further clarification is needed on the definition of unavailability of a reference cell on a carrier frequency subject to CCA. * **Observation 5:** For the case when the UE is configured with measurement gaps, in principle no further clarification is needed on the definition of unavailability of a reference cell on a carrier frequency subject to CCA. * **Proposal 1:** For the sake of progress we can support the following option [1]:   + *In the requirements of clause 7.1.2, the term reference cell on a carrier frequency subject to CCA is not available at the UE refers to when at least one SSB is configured by gNB, but the first two successive candidate SSB positions for the same SSB index within the discovery burst transmission window are not available for at least one SSB, at the UE due to DL CCA failures at gNB during the last X ms; otherwise the reference cell on the carrier frequency subject to CCA is considered as available at the UE.*   *X is FFS, X>160ms.*   * **Proposal 2:** In proposal #1, we can support X =1280 ms. |

## Open issues summary

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

Background:

The way forward from last meeting contains following open issue related timing [R4-2105700]:

|  |
| --- |
| **Timing: Definition of the reference cell which is not available, with respect to DRX**   * Proposal 1 (Ericsson, Qualcomm Incorporated, Huawei, HiSilicon): SSB does not have to be within ON duration in a reference cell subject to DL CCA in order to meet UE timing requirements   + No clarification related to DRX is needed on the current definition of unavailability of a reference cell on a carrier frequency subject to CCA in section 7.1.1. * Proposal 2: (Qualcomm, Apple, MTK):   + In the requirements of clause 7.1.2, the term reference cell on a carrier frequency subject to CCA is not available at the UE refers to when at least one SSB is configured by gNB, but the first two successive candidate SSB positions for the same SSB index within the discovery burst transmission window are not available for at least one SSB, at the UE due to DL CCA failures at gNB during the last X ms**;** otherwise the reference cell on the carrier frequency subject to CCA is considered as available at the UE.     - X is FFS, X>160ms.   **Timing: Definition of the reference cell which is not available, with respect to MGs**   * Proposal 1 (Ericsson, Qualcomm): SSB in a reference cell subject to DL CCA does not have to be outside the gaps in order to meet UE timing requirements   1. No clarification related to gap is needed on the current definition of unavailability of a reference cell on a carrier frequency subject to CCA in section 7.1.1.      * Proposal 2 (Huawei, ZTE, MTK): The availability of reference cell shall base on the SSB within the DL active BWP which is not overlapping with measurement gaps. * Proposal 3: (Qualcomm, Apple, MTK):   1. In the requirements of clause 7.1.2, the term reference cell on a carrier frequency subject to CCA is not available at the UE refers to when at least one SSB is configured by gNB, but the first two successive candidate SSB positions for the same SSB index within the discovery burst transmission window are not available for at least one SSB, at the UE due to DL CCA failures at gNB during the last X ms**;** otherwise the reference cell on the carrier frequency subject to CCA is considered as available at the UE.      + 1. X is FFS, X>160ms. |

### Sub-topic 4-1: DRX impact on timing

**Issue 4-1-1: Definition of the reference cell which is not available, with respect to DRX**

Proposals

* Proposal 1 (ZTE Corporation): SSB does not have to be within ON duration in a reference cell subject to DL CCA in order to meet UE timing requirements. No clarification related to DRX is needed on the current definition of unavailability of a reference cell on a carrier frequency subject to CCA in section 7.1.1.
* Proposal 2 (Apple, Ericsson):
  + In the requirements of clause 7.1.2, the term reference cell on a carrier frequency subject to CCA is not available at the UE refers to when at least one SSB is configured by gNB, but the first two successive candidate SSB positions for the same SSB index within the discovery burst transmission window are not available for at least one SSB, at the UE due to DL CCA failures at gNB during the last X ms; otherwise the reference cell on the carrier frequency subject to CCA is considered as available at the UE.
    - X = 1280ms.
* Proposal 4 (Ericsson):
  + In the requirements of clause 7.1.2, the term reference cell on a carrier frequency subject to CCA is not available at the UE refers to when at least one SSB is configured by gNB, but the first two successive candidate SSB positions for the same SSB index within the discovery burst transmission window are not available for at least one SSB, at the UE due to DL CCA failures at gNB during the last X ms; otherwise the reference cell on the carrier frequency subject to CCA is considered as available at the UE.
    - X is FFS, X>160ms.

Recommended WF

* **Update after GTW session 2021-05-20:**
* Issue is resolved with following agreement reached in the GTW session:
  + Agreements:
    - In the requirements of clause 7.1.2, the term reference cell on a carrier frequency subject to CCA is not available at the UE refers to when at least one SSB is configured by gNB, but the first two successive candidate SSB positions for the same SSB index within the discovery burst transmission window are not available during at least one discovery burst transmission window, at the UE due to DL CCA failures at gNB during the last X ms; otherwise the reference cell on the carrier frequency subject to CCA is considered as available at the UE.
    - X = 1280ms.

### Sub-topic 4-2: Measurement gaps impact on timing

**Issue 4-2-1: Definition of the reference cell which is not available, with respect to MGs**

Proposals

* Proposal 1 (ZTE Corporation): No clarification related to gap is needed on the current definition of unavailability of a reference cell on a carrier frequency subject to CCA in section 7.1.1.
* Proposal 2 (Huawei, HiSilicon): The availability of reference cell shall base on the SSB within the DL active BWP which is not overlapping with measurement gaps.
* Proposal 2 (Apple, Ericsson):
  + In the requirements of clause 7.1.2, the term reference cell on a carrier frequency subject to CCA is not available at the UE refers to when at least one SSB is configured by gNB, but the first two successive candidate SSB positions for the same SSB index within the discovery burst transmission window are not available for at least one SSB, at the UE due to DL CCA failures at gNB during the last X ms; otherwise the reference cell on the carrier frequency subject to CCA is considered as available at the UE.
    - X = 1280ms.
* Proposal 4 (Ericsson):
  + In the requirements of clause 7.1.2, the term reference cell on a carrier frequency subject to CCA is not available at the UE refers to when at least one SSB is configured by gNB, but the first two successive candidate SSB positions for the same SSB index within the discovery burst transmission window are not available for at least one SSB, at the UE due to DL CCA failures at gNB during the last X ms; otherwise the reference cell on the carrier frequency subject to CCA is considered as available at the UE.
    - X is FFS, X>160ms.

Recommended WF

* Discuss the proposals
* **Update after GTW session 2021-05-20:**
* Issue is resolved with following agreement reached in the GTW session:
  + Agreements:
    - In the requirements of clause 7.1.2, the term reference cell on a carrier frequency subject to CCA is not available at the UE refers to when at least one SSB is configured by gNB, but the first two successive candidate SSB positions for the same SSB index within the discovery burst transmission window are not available during at least one discovery burst transmission window, at the UE due to DL CCA failures at gNB during the last X ms; otherwise the reference cell on the carrier frequency subject to CCA is considered as available at the UE.
    - X = 1280ms.

## Companies views’ collection for 1st round

### Open issues

|  |  |
| --- | --- |
| **Company** | **Comments** |
| Apple | **Issue 4-1-1: Definition of the reference cell which is not available, with respect to DRX**  Support proposal 2  **Issue 4-2-1: Definition of the reference cell which is not available, with respect to MGs**  Support **proposal** 3. We think unified solution can apply for all the cases. If serving cell SSB is outside active BWP, the timing tracking on SSB shall be performed during the MGL. When MG is shared by multiple MOs and the RF was tuned to other frequency layer for L3 measurement in a certain MGL, the SSB in this MGL could not be used for serving cell time tracking. But within 1280ms there are at least 8 MGs, and UE can flexibly reschedule the measurement order to tune back to serving cell SSB for timing tracking. |
| Qualcomm | **Issue 4-1-1: Definition of the reference cell which is not available, with respect to DRX**  We can support proposal 2 with a minor correction (to avoid any ambiguity)   * + In the requirements of clause 7.1.2, the term reference cell on a carrier frequency subject to CCA is not available at the UE refers to when at least one SSB is configured by gNB, but the first two successive candidate SSB positions for the same SSB index within the discovery burst transmission window are not available ~~for~~ during at least one ~~SSB~~ discovery burst transmission window, at the UE due to DL CCA failures at gNB during the last X ms; otherwise the reference cell on the carrier frequency subject to CCA is considered as available at the UE.     - X = 1280ms.   **Issue 4-2-1: Definition of the reference cell which is not available, with respect to MGs**  We can support proposal 3, with the same clarification/correction as above. |
| MTK | **Issue 4-1-1:** Support proposal 2 (Apple, Ericsson) and Qualcomm’s correction.  **Issue 4-2-1:** Support proposal 3 (Apple, Ericsson). The Proposal 2 (Huawei, HiSilicon) seems can be included in proposal 3, because during X ms there will be some SSBs outside gap. |

### 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** | **Comments collection** |
| R4-2109298 (Apple, MediaTek, Ericsson) | Ericsson: There was a slight update on the wording that needs to be taken into account. |
| Company B |
|  |
| R4-2110310 (Huawei, HiSilicon) | Ericsson: Given the updated agreement from GTW, we propose to agree on R4-2109298. |
| 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 4-1** | **Issue 4-1-1: Definition of the reference cell which is not available, with respect to DRX**  *Tentative agreements:*  *Agreement from GTW:*   * + Agreements:     - In the requirements of clause 7.1.2, the term reference cell on a carrier frequency subject to CCA is not available at the UE refers to when at least one SSB is configured by gNB, but the first two successive candidate SSB positions for the same SSB index within the discovery burst transmission window are not available during at least one discovery burst transmission window, at the UE due to DL CCA failures at gNB during the last X ms; otherwise the reference cell on the carrier frequency subject to CCA is considered as available at the UE.     - X = 1280ms.   *Candidate options:*  *Recommendations for 2nd round:*  To work on the CR and capture the agreement in WF. |
| **Subtopic 4-2** | **Issue 4-2-1: Definition of the reference cell which is not available, with respect to MGs**  *Tentative agreements:*   * + Agreements:     - In the requirements of clause 7.1.2, the term reference cell on a carrier frequency subject to CCA is not available at the UE refers to when at least one SSB is configured by gNB, but the first two successive candidate SSB positions for the same SSB index within the discovery burst transmission window are not available during at least one discovery burst transmission window, at the UE due to DL CCA failures at gNB during the last X ms; otherwise the reference cell on the carrier frequency subject to CCA is considered as available at the UE.     - X = 1280ms.   *Candidate options:*  *Recommendations for 2nd round:*  To work on the CR and capture the agreement in WF. |

### 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: Endorsed CRs

Contributions from AI 6.1.5 and AI 6.1.5.3 that contain CRs that were already endorsed at RAN4#98bis-e meeting but are resubmitted for formal approvals are listed here.

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2110312 | Huawei, HiSilicon | CR on Active TCI state switching for NR-U R16 |
| R4-2110314 | Huawei, HiSilicon | CR on RLM requirements NR-U R16 |
| R4-2110316 | Huawei, HiSilicon | CR on beam management requirements for NR-U R16 |
| R4-2110318 | Huawei, HiSilicon | CR on measurement requirements for NR-U R16 |
| R4-2110320 | Huawei, HiSilicon | CR on CSSF for NR-U R16 |
| R4-2110322 | Huawei, HiSilicon | CR on core requirements maintenance of IDLE mode inter-RAT measurement for NR-U R16 |
| R4-2110324 | Huawei, HiSilicon | CR on PSCell Addition requirements for NR-U R16 |
| R4-2109300 | Apple | CR on SCell activation requirement for NR-U R16 |
| R4-2108168 | Ericsson | Terminology updates for NR-U in 38.133 |
| R4-2108170 | Ericsson | Terminology updates for NR-U in 36.133 |
| R4-2108172 | Ericsson | Updates in SCell activation in NR-U |
| R4-2108174 | Ericsson | NR-U bands |

## Open issues summary

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

## Companies views’ collection for 1st round

### Open issues

|  |  |
| --- | --- |
| **Company** | **Comments** |
|  |  |

### 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** | **Comments collection** |
| R4-2110312 | Company A |
| Company B |
|  |
| R4-2110314 | Company A |
| Company B |
|  |
| R4-2110316 | Company A |
| Company B |
|  |
| R4-2110318 | Company A |
| Company B |
|  |
| R4-2110320 | Company A |
| Company B |
| R4-2110322 | Company A |
| Company B |
| R4-2110324 | Company A |
| Company B |
| R4-2109300 | 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** |
|  |  |

### 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”.*

### 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** | **Comments collection** |
| R4-2108168 (Ericsson) |  |
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| R4-2108170 (Ericsson) |  |
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|  |
| R4-2108172  (Ericsson) |  |
|  |
|  |  |
| R4-2108174 (Ericsson) |  |
|  |
|  |  |

# Recommendations for Tdocs

## 1st round

**New tdocs**

|  |  |  |
| --- | --- | --- |
| **Title** | **Source** | **Comments** |
| WF on … | YYY |  |
| LS on … | ZZZ | To: RAN\_X; Cc: RAN\_Y |
| WF on NR-U RRM Core Requirements | Ericsson | To capture the agreements and issues from this meeting. |

**Existing tdocs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation** | **Comments** |
| R4-210xxxx | CR on … | XXX | Agreeable, Revised, Merged, Postponed, Not Pursued |  |
| R4-2109416 | Terminology update for NR-U | Nokia, Nokia Shanghai Bell | Agreeable |  |
| R4-2109274 | Terminology update for NR-U | Nokia, Nokia Shanghai Bell | Agreeable |  |
| R4-2111513 | SI reading time in RRC mobility control | Qualcomm Incorporated | Agreeable |  |
| R4-2111514 | SI reading time in RRC mobility control | Qualcomm Incorporated | Agreeable |  |
| R4-2110307 | CR on SCell activation and deactivation for NR-U R16 | Huawei, HiSilicon | Return to | *Pending agreements in issues 3-1-2 and 3-1-3* |
| R4-2110308 | CR on SCell activation and deactivation for NR-U R17 | Huawei, HiSilicon | Return to |  |
| R4-2111254 | NR-U SCell activiation interruption requirements in 38.133 | Ericsson | Return to |  |
|  |  |  |  |  |
| R4-2111511 | Interruption during Scell activation requirements for SCells operating with CCA | Qualcomm Incorporated | Revised | *Pending agreements in issues 3-1-2 and 3-1-3* |
| R4-2111512 | Interruption during Scell activation requirements for SCells operating with CCA | Qualcomm Incorporated | Return to |  |
| R4-2109298 | CR on reference cell availability for NR-U R16 | Apple, MediaTek, Ericsson | Revised |  |
| R4-2109299 | CR on reference cell availability for NR-U R17 | Apple, MediaTek, Ericsson | Return to |  |
| R4-2110310 | CR on timing requirements for NR-U R16 | Huawei, HiSilicon | Noted |  |
| R4-2110311 | CR on timing requirements for NR-U R17 | Huawei, HiSilicon | Withdrawn |  |
| R4-2109300 | CR on SCell activation requirement for NR-U R16 | Apple | Agreeable |  |
| R4-2109301 | CR on SCell activation requirement for NR-U R17 | Apple | Agreeable |  |
| R4-2110312 | CR on Active TCI state switching for NR-U R16 | Huawei, HiSilicon | Agreeable |  |
| R4-2110313 | CR on Active TCI state switching for NR-U R17 | Huawei, HiSilicon | Agreeable |  |
| R4-2110314 | CR on RLM requirements NR-U R16 | Huawei, HiSilicon | Agreeable |  |
| R4-2110315 | CR on RLM requirements NR-U R17 | Huawei, HiSilicon | Agreeable |  |
| R4-2110316 | CR on beam management requirements for NR-U R16 | Huawei, HiSilicon | Agreeable |  |
| R4-2110317 | CR on beam management requirements for NR-U R17 | Huawei, HiSilicon | Agreeable |  |
| R4-2110318 | CR on measurement requirements for NR-U R16 | Huawei, HiSilicon | Agreeable |  |
| R4-2110319 | CR on measurement requirements for NR-U R17 | Huawei, HiSilicon | Agreeable |  |
| R4-2110320 | CR on CSSF for NR-U R16 | Huawei, HiSilicon | Agreeable |  |
| R4-2110321 | CR on CSSF for NR-U R17 | Huawei, HiSilicon | Agreeable |  |
| R4-2110322 | CR on core requirements maintenance of IDLE mode inter-RAT measurement for NR-U R16 | Huawei, HiSilicon | Agreeable |  |
| R4-2110323 | CR on core requirements maintenance of IDLE mode inter-RAT measurement for NR-U R17 | Huawei, HiSilicon | Agreeable |  |
| R4-2110324 | CR on PSCell Addition requirements for NR-U R16 | Huawei, HiSilicon | Agreeable |  |
| R4-2110325 | CR on PSCell Addition requirements for NR-U R17 | Huawei, HiSilicon | Agreeable |  |
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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

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| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation** | **Comments** |
| R4-210xxxx | CR on … | XXX | Agreeable, Revised, Merged, Postponed, Not Pursued |  |
| R4-210xxxx | WF on … | YYY | Agreeable, Revised, Noted |  |
| R4-210xxxx | LS on … | ZZZ | Agreeable, Revised, Noted |  |
| R4-2108168 | Terminology updates for NR-U in 38.133 | Ericsson |  | Endorsed CR, late submission. |
| R4-2108169 | Terminology updates for NR-U in 38.133 | Ericsson |  | Endorsed CR, late submission. |
| R4-2108170 | Terminology updates for NR-U in 36.133 | Ericsson |  | Endorsed CR, late submission. |
| R4-2108171 | Terminology updates for NR-U in 36.133 | Ericsson |  | Endorsed CR, late submission. |
| R4-2108172 | Updates in SCell activation in NR-U | Ericsson |  | Endorsed CR, late submission. |
| R4-2108173 | Updates in SCell activation in NR-U | Ericsson |  | Endorsed CR, late submission. |
| R4-2108174 | NR-U bands | Ericsson |  | Endorsed CR, late submission. |
| R4-2108175 | NR-U bands | Ericsson |  | Endorsed CR, late submission. |
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Notes:

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   1. CRs/TPs: Agreeable, Revised, Merged, Postponed, Not Pursued
   2. Other documents: Agreeable, Revised, Noted
3. Do not include hyper-links in the documents