3GPP TSG-RAN WG4 meeting #99-eR4-21xxxx

Electronic Meeting, 19th – 27th May 2021

**Agenda item:** 4.2.3, 5.2.2.3, 5.2.1

**Source:** Moderator (Ericsson)

**Title:** Email discussion summary for [99-e][203] LTE\_RRM\_maintenance

**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: NB-IoT (AI 4.2.3)**
* **Topic #2: Rel-16 MTC (AI 5.2.2.3)**

Sub-topic 3-1: RSS based RSRQ measurement

Issue 2-1-1: RSS based RSRQ measurement

Issue 2-1-2: LS to RAN2 about RAN4 agreement

* **Topic #3: Even further mobility enhancement (AI 5.2.1)**

Sub-topic 3-1: Further clarification on DL-to-UL and UL-to-DL switching time

Issue 3-1-1: Further clarification on DL-to-UL and UL-to-DL switching time in DAPS handover

## 2nd round

TBD

# Topic #1: NB-IoT

Contributions from AI 4.2.3 are discussed here.

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2110349 | Huawei, HiSilicon | CR: On RRC re-establishment for NB-IoT R13 |
| R4-2110354 | Huawei, HiSilicon | CR: On requirements of cell reselection for NB-IoT R14 |
|  |  |  |
|  |  |  |

## 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

*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** |
| R4-2110349 (Huawei, HiSilicon) | Company A |
| Company B |
|  |
| R4-2110354 (Huawei, HiSilicon) | 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**  |
|  | *Tentative agreements:**Candidate options:**Recommendations for 2nd round:* |

### 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)

# Topic #2: Rel-16 MTC

Contributions from AI 5.2.2.3 are discussed here.

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2109868 | Qualcomm Incorporated | CR: Time synchronization assumption for RSS-based neighbor cell measurements |
| R4-2110276 | Nokia, Nokia Shanghai Bell | 1. RAN4 to discuss the pros and cons of both approaches, i.e. whether to introduce RSS based RSRQ requirements in RAN1 and RAN4 specifications or to adjust applicability requirements in TS 36.133 to enable reuse of existing CRS based RSRQ measurements in case of RSS based RSRP measurement configuration.
 |
| R4-2110853 | Huawei, HiSilicon | **Proposal:** Capture the following assumption and condition for RSS measurement in 36.133:For performing RSRP measurement based on RSS on detected intra-frequency cells, UE assumes the neighbour cell RSS starts in the radio frame (w.r.t. neighbor cell timing) that is closest in time to the derived serving cell radio frame offset, and the requirements apply provided that neighbor cell starts RSS transmission from said radio frame. |
| R4-2110854 | Huawei, HiSilicon | CR: On remaining issues in Rel-16 eMTC RRM |
| R4-2111251 | Ericsson | * Observation #1: Rel-16 eMTC WI objective only includes improving the DL RSRP measurement accuracy through use of RSS, i.e. RSRQ is not included.
* Observation #2: Rel-16 WI on eMTC is completed and thus RSRQ measurement support through use of RSS (if introduced) has be done under TEI work item.
* Observation #3: Only small technical enhancement work is allowed under TEI work item.
* Observation #4: The work of introducing RSS based RSRQ can be divided into following:
	+ Agreeing on simulation assumptions
	+ Evaluating the feasibility of RSRQ
	+ If found feasible, develop detailed requirements
* **Proposal:** RSS based RSRQ shall not be introduced under TEI work for release 16 eMTC.
 |
| R4-2110647 | Ericsson | CR: Correction of RLM test parameters for MPDCCH performance improvement |

## 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

Background: RAN4 has received LS response related to RSS based RSRQ measurement as follows [R2-2104392]:

|  |
| --- |
| The options proposed by RAN4 are:* *Option 1: Remove RSRQ from the cell selection and cell re-selection criterion when a cell is measured using RSS.*
* *Option 2: Define RSRQ for RSS measurements*

RAN2 has discussed the options listed in the LS and concluded that from RAN2 perspective option 1 is not preferred because it may have an impact on cell (re)-selection performance and behaviour, but it is up to RAN1 and RAN4 to decide. |

### Sub-topic 2-1: RSS based RSRQ measurement

**Issue 2-1-1: RSS based RSRQ measurement**

Proposals

* Proposal 1 (Ericsson):
	+ RSS based RSRQ shall not be introduced under TEI work for release 16 eMTC.

Recommended WF

* Discuss the proposal

**Issue 2-1-2: LS to RAN2 about RAN4 agreement**

Proposals

* + Proposal 1 (Ericsson): Send LS RAN2 informing about the RAN4 agreement to no introduce RSS based RSRQ measurement in release 16.

Recommended WF

* Discuss whether to send the LS in R4-2111251

|  |  |
| --- | --- |
| **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** |
| *R4-2109868* (Qualcomm Incorporated) | Company A |
| Company B |
|  |
| R4-2110854 (Huawei, HiSilicon) | Company A |
| Company B |
|  |
| R4-2110647 (Ericsson) |  |

## 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 2-1-1: RSS based RSRQ measurement****Issue 2-1-2: LS to RAN2 about RAN4 agreement***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: Even further mobility enhancement

Contributions from AI 5.2.1 are discussed here.

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2110375 | Huawei, HiSilicon | CR: Clarification on asynchronous DAPS handover |
| R4-2110391 | Ericsson | CR: Correction on the synchronous condition for DAPS handover |
| R4-2110390 | Ericsson | **Observation 1:** Network does not know the exact timing condition at UE when DAPS HO is being performed**Observation 2:** It is important not to extend GP to facilitate DAPS operation, from an overhead perspective**Proposal 1:** Prior to random access procedure autonomous interruption is done in communication towards the target cell as necessary to enable the UE to have sufficient switching time, and after the random access procedure autonomous interruption is done in communication towards source cell as necessary to allow the UE to have sufficient switching 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.*

Background:

Following issue from the NR DAPS way forward agreed in RAN4#97 is discussed:

|  |
| --- |
| * Issue 1-3: further clarification on DL-to-UL and UL-to-DL switching time
	+ Option 1: clarify that 13us switching time is allowed between source cell and target cell:
		- Note 2: For DAPS handover on a TDD band, a UE is not expected to transmit in the uplink to source or target cell earlier than NRX-TX after the end of the last received downlink symbol from source or target cell in the same TDD band where NRX-TX=25600Tc.
		- Note 3: For DAPS handover on a TDD band, a UE is not expected to receive in the downlink from source or target cell earlier than NTX-RX after the end of the last transmitted uplink symbol toward source or target cell in the same TDD band where NTX-RX=25600Tc.
	+ Option 2: Retain the existing specification that DL-to-UL and UL-to-DL switching time applies within the same cell
		- Note 2:      For DAPS handover on a TDD band, a UE is not expected to transmit in the uplink earlier than NRX-TXafter the end of the last received downlink symbol in the same cell where NRX-TX=25600Tc.
		- Note 3:  For DAPS handover on a TDD band, a UE is not expected to receive in the downlink earlier than NTX-RX after the end of the last transmitted uplink symbol in the same cell where NTX-RX=25600Tc.
	+ Option 3: clarify that 10us switching time is allowed between source cell and target cell
		- Note 2: For DAPS handover on a TDD band, a UE is not expected to transmit in the uplink to source or target cell earlier than NRX-TX after the end of the last received downlink symbol from source or target cell in the same TDD band where NRX-TX=19712Tc.
		- Note 3: For DAPS handover on a TDD band, a UE is not expected to receive in the downlink from source or target cell earlier than NTX-RX after the end of the last transmitted uplink symbol toward source or target cell in the same TDD band where NTX-RX=19712Tc.
	+ Other options
 |

### Sub-topic 3-1: Further clarification on DL-to-UL and UL-to-DL switching time

**Issue 3-1-1: Further clarification on DL-to-UL and UL-to-DL switching time in DAPS handover**

Proposals

* Proposal 1 (Ericsson):
	+ Prior to random access procedure autonomous interruption is done in communication towards the target cell as necessary to enable the UE to have sufficient switching time, and after the random access procedure autonomous interruption is done in communication towards source cell as necessary to allow the UE to have sufficient switching time.

Recommended WF

* Discuss the proposal

## Companies views’ collection for 1st round

### Open issues

|  |  |
| --- | --- |
| **Company** | **Comments** |
|  | **Issue 3-1-1: Further clarification on DL-to-UL and UL-to-DL switching time** |

### 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** |
| R4-2110375(Huawei, HiSilicon) | Company A |
| Company B |
|  |
| R4-2110391 (Ericsson) | 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 4-1** | **Issue 3-1-1: Further clarification on DL-to-UL and UL-to-DL switching time***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**

|  |  |  |
| --- | --- | --- |
| **Title** | **Source** | **Comments** |
| WF on … | YYY |  |
| LS on … | ZZZ | To: RAN\_X; Cc: RAN\_Y |
|  |  |  |

**Existing tdocs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation**  | **Comments** |
| R4-210xxxx | CR on … | XXX | Agreeable, Revised, Merged, Postponed, Not Pursued |  |
| R4-2110349 | CR on RRC re-establishment for NB-IoT R13 | Huawei, HiSilicon |  |  |
| R4-2110350 | CR on RRC re-establishment for NB-IoT R14 | Huawei, HiSilicon |  |  |
| R4-2110351 | CR on RRC re-establishment for NB-IoT R15 | Huawei, HiSilicon |  |  |
| R4-2110352 | CR on RRC re-establishment for NB-IoT R16 | Huawei, HiSilicon |  |  |
| R4-2110353 | CR on RRC re-establishment for NB-IoT R17 | Huawei, HiSilicon |  |  |
| R4-2110354 | CR on requirements of cell reselection for NB-IoT R14 | Huawei, HiSilicon |  |  |
| R4-2110355 | CR on requirements of cell reselection for NB-IoT R15 | Huawei, HiSilicon |  |  |
| R4-2110356 | CR on requirements of cell reselection for NB-IoT R16 | Huawei, HiSilicon |  |  |
| R4-2110357 | CR on requirements of cell reselection for NB-IoT R17 | Huawei, HiSilicon |  |  |
| R4-2109868 | Time synchronization assumption for RSS-based neighbor cell measurements | Qualcomm Incorporated |  |  |
| R4-2109869 | Time synchronization assumption for RSS-based neighbor cell measurements | Qualcomm Incorporated |  |  |
| R4-2110854 | CR on remaining issues in Rel-16 eMTC RRM | Huawei, HiSilicon |  |  |
| R4-2110855 | CR on remaining issues in Rel-16 eMTC RRM R17 | Huawei, HiSilicon |  |  |
| R4-2111251 | LS on RAN4 agreement on RSS based RSRQ measurement for cat-M | Ericsson |  |  |
| R4-2110375 | Clarification on asynchronous DAPS handover R16 | Huawei, HiSilicon |  |  |
| R4-2110376 | Clarification on asynchronous DAPS handover R17 | Huawei, HiSilicon |  |  |
| R4-2110391 | Correction on the synchronous condition for DAPS handover | Ericsson |  |  |
| R4-2110392 | Correction on the synchronous condition for DAPS handover | Ericsson |  |  |
| R4-2110647 | Correction of RLM test parameters for MPDCCH performance improvement | Ericsson |  |  |
| R4-2110779 | Correction of RLM test parameters for MPDCCH performance improvement | Ericsson |  |  |

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** | **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 |  |
|  |  |  |  |  |

Notes:

1. Please include the summary of recommendations for all tdocs across all sub-topics.
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. Do not include hyper-links in the documents