**3GPP TSG-RAN WG4 Meeting #101-bis-e R4-**

**Online Meeting, 17 January – 25 January 2022**

**Agenda item:** 6.17.3

**Source:** Moderator (ZTE Corporation)

**Title:** Email discussion summary for [101-bis-e][218] NR\_IAB\_enh\_RRM

**Document for:** Information

# Introduction

TDocs submitted to the following agenda items will be treated:

- 6.17.3 RRM core requirements

List of candidate target of email discussion for 1st round and 2nd round

* 1st round: Companies discuss open issues and provide comments on the CR/TP.
* 2nd round: Finalize on the open issues and the CR/TP.

# Topic #1: RRM requirements related to timing and CLI

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

## Companies’ contributions summary

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| **T-doc number** | **Company** | **Proposals / Observations** |
| [**R4-2201206**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_101-bis-e/Docs/R4-2201206.zip) | Huawei, Hisilicon | **Observation 1: According to RAN1’s spec, MT Tx timing in Case#6 is determined by its DU Tx timing regardless of which type of implementations.****Observation 2: The legacy transmit timing requirement is to guarantee the performance of DL timing estimation accuracy.****Proposal 1: Clarify that current transmit timing requirements apply to case#1 timing mode, and no other RRM impact of case#6 timing.****Observation 3: There is no enhancement on CLI measurement and reporting for Rel-17 eIAB compared with Rel-16 IAB based on RAN1/2 agreements.****Proposal 2: For CLI measurements by IAB-MT, no RRM requirements need to be specified as there is no enhancement on CLI measurement for Rel-17 eIAB compared with Rel-16.** |
| [**R4-2201207**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_101-bis-e/Docs/R4-2201207.zip) | Huawei, Hisilicon | Draft CR on timing requirements for Rel-17 IAB |
| [**R4-2201405**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_101-bis-e/Docs/R4-2201405.zip) | ZTE Corporation | **Proposal 1:** For CLI measurements by IAB-MT, no RRM requirements need to be specified. |
| [**R4-2201849**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_101-bis-e/Docs/R4-2201849.zip) | Nokia, Nokia Shanghai Bell | **On Case#6 timing RRM requirements:**1. It is agreed in RAN4 that RF requirements for Timing error between own MT TX and DU TX should be defined for Case#6 timing. The discussion is still ongoing.
	1. At the last RAN1#107-e meeting, all of the RAN1 WID objectives were fulfilled.
	2. Case#6 timing is supported in Rel-17 and can rely on an OTA timing synchronization mechanism.
	3. The only RAN1 specification impact is that T\_delta range is updated to support Case 6 timing.
	4. IAB-MT is provided with a Timing Case Indication via MAC-CE i.e., one of {Case 1, Case 6, Case 7} for each slot.

The cell phase synchronisation accuracy for IAB-DUs is already specified in TS 38.174, Clause 12.2.42.1. RAN4 not to introduce any new RRM requirements for Case#6 timing scheme.

In Case#6 scheme, the IAB-MT UL Tx is set by the node to the timing obtained for the node’s DL Tx, i.e., it is not based directly on the first detected path (in time) of the corresponding downlink frame from the reference cell.Current IAB-MT transmit timing requirements in TS 38.174, Clause 12.2.1 cover only legacy TA-based mechanism, i.e., when IAB-MT timing is controlled by timing adjustment command from the parent node.1. RAN4 to reflect in TS 38.174, that exiting IAB-MT transmit timing requirements are applicable to Case#1 timing only.

**On CLI RRM requirements:**Rel-16 interference management frameworks (e.g. CLI, RIM) is used to handle IAB interference scenarios in Rel-17. The only agreed enhancement in RAN1 is that coordination signalling (Intended TDD DL-UL Configuration) is extended to support IAB specific UFD patterns. DFU patterns were already present in the Rel-16 IAB specifications without any impact on RAN4 RRM requirements.**Proposal 3: For CLI measurements by IAB-MT, no new RRM requirements need to be specified.** |
| [**R4-2201850**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_101-bis-e/Docs/R4-2201850.zip) | Nokia, Nokia Shanghai Bell | TP to TS 38.174 on RRM Timing Requirements |
| [**R4-2202019**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_101-bis-e/Docs/R4-2202019.zip) | Ericsson | **Case 1 and 7 timings:*** **Observation 1**: RAN1 has specified procedures for Case #1, Case # 6 and Case #7 timings for IAB-MT transmission timing in TS 38.213 v17.0.0.
* **Observation 2**: Case #1 timing for IAB-MT transmission timing is based on the existing UE timing advance mechanism as specified in clause 4.2, TS 38.213.
* **Observation 3**: Case #7 timing for IAB-MT transmission timing is also fundamentally based on the existing UE timing advance mechanism as specified in clause 4.2, TS 38.213, except an additional configurable offset ($N\_{TA,offset,2}$).
* **Observation 4**: Timing advance step size accuracy requirements aready exist in clause 12.2.3, TS 38.174.
* **Proposal #1**: The existing timing advance step size accuracy requirements in clause 12.2.3, TS 38.174, are applicable for Case #1 and Case # 7 timings.
* **Proposal #2**: No new RRM requirements are needed for Case #1 and Case # 7 timing procedures.

**Case 6 timing:*** **Observation 5**: According to Case # 6 timing procedure, the transmission timing of the IAB-MT is set to the transmission timing of the IAB-DU in the same IAB-node
* **Observation 6**: Any relative timing error between the transmission timings of IAB-MT and IAB-DU in the same IAB node depends on IAB internal architecture and depends on RF impairements inside the IAB. These issues are outside the scope of RRM.
* **Proposal #3**: No RRM requirements are needed for Case # 6 timing procedure.

**CLI for IAB:*** **Observation 7**: According to RAN1 approved IAB CR, there is no new IAB specific CLI procedure for IAB is based on existing Rel-16 CLI solutions for UE.
* **Observation 8**: It is expected that RAN2/RAN3 signaling for CLI for IAB will be based on the existing Rel-16 CLI solutions for UE.
* **Observation 9**: Unlike, the UE, which moves around, the IAB is fixed node. Therefore, the need for CLI requirements (if CLI is needed) will depend on the actual deployment scenario.
* **Observation 10**: RAN4 concluded in Rel-16 not to define RRM measurement requirements for IAB-MT to prevent any implementation limitation.
* **Proposal #4**: For CLI measurements by IAB-MT, no RRM requirements need to be specified.
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| [**R4-2203353**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_101-bis-e/Docs/R4-2203353.zip) | Qualcomm | **RAN1 agreement (**RAN1 #103-e**) regarding CLI*** **Use the Rel-16 interference management frameworks (e.g. CLI, RIM) to handle IAB interference scenarios,**

**Proposal 1: RAN4 needs to define CLI measurement requirements and Rel 16 UE CLI measurement requirement can be used as baseline.****Clarification: RAN4 does not need to define any new RRM requirement for Rel-17 eIAB CLI measurement but the already defined CLI measurement requirement for Rel-16 UE should be adopted.**  |

## 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

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

**Issue 1-1: Case 1 timing**

* Proposals
	+ Option 1: Clarify that current transmit timing requirements apply to case#1 timing mode. (Huawei, Nokia)
	+ Option 2: (Ericsson)
		- The existing timing advance step size accuracy requirements in clause 12.2.3, TS 38.174, are applicable for Case #1 timings.
		- No new RRM requirements are needed for Case #1 timing procedures.
* Recommended WF
	+ Discussions are needed. Options are not mutually exclusive.

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| **Company** | **Comments** |
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**Issue 1-2: Case 6 timing**

* Proposals
	+ Option 1: Clarify that no other RRM impact of case#6 timing. (Huawei, Nokia, E///)
* Recommended WF
	+ Discussions are needed.

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| **Company** | **Comments** |
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**Issue 1-3: Case 7 timing**

* Proposals
	+ Option 1: (Ericsson)
		- The existing timing advance step size accuracy requirements in clause 12.2.3, TS 38.174, are applicable for Case # 7 timings. (Ericsson)
		- No new RRM requirements are needed for Case # 7 timing procedures. (Ericsson)
* Recommended WF
	+ Discussions are needed.

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| **Company** | **Comments** |
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**Issue 1-4: CLI measurement**

* Proposals
	+ Option 1: For CLI measurements by IAB-MT, no new RRM requirements need to be specified in R17. (Huawei, ZTE, Nokia, Ericsson)
	+ Option 2: RAN4 needs to define CLI measurement requirements and Rel 16 UE CLI measurement requirement can be used as baseline. (Qualcomm)
* Recommended WF: Discussion is needed.

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| **Company** | **Comments** |
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### CRs/TPs comments collection

*Moderator: The two contributions are addressing to a same issue. See if the CR/TP can be merged.*

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| **CR/TP number** | **Comments collection** |
| [**R4-2201207**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_101-bis-e/Docs/R4-2201207.zip) |  |
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| [**R4-2201850**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_101-bis-e/Docs/R4-2201850.zip) |  |
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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**  |
| **Issue 1-1** |  |
| **Issue 1-2** |  |

## Discussion on 2nd round (if applicable)

### Open issues

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| **Company** | **Comments** |
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# Recommendations for Tdocs

## 1st round

**New tdocs**

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| **Title** | **Source** | **Comments** |
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**Existing tdocs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation**  | **Comments** |
| [**R4-2201206**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_101-bis-e/Docs/R4-2201206.zip) | Discussion on RRM requirements for eIAB | Huawei, Hisilicon |  |  |
| [**R4-2201207**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_101-bis-e/Docs/R4-2201207.zip) | Draft CR on timing requirements for Rel-17 IAB | Huawei, Hisilicon |  |  |
| [**R4-2201405**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_101-bis-e/Docs/R4-2201405.zip) | On RRM for eIAB | ZTE Corporation |  |  |
| [**R4-2201849**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_101-bis-e/Docs/R4-2201849.zip) | On IAB Enhanced RRM Requirements | Nokia, Nokia Shanghai Bell |  |  |
| [**R4-2201850**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_101-bis-e/Docs/R4-2201850.zip) | TP to TS 38.174 on RRM Timing Requirements | Nokia, Nokia Shanghai Bell |  |  |
| [**R4-2202019**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_101-bis-e/Docs/R4-2202019.zip) | Further analysis of RRM requirements for enhanced IAB | 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** |
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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

# Annex

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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)