**3GPP TSG-RAN WG4 Meeting #102-e R4-220XXXX**

**Electronic Meeting, 21st Feb 2022 – 3rd Mar 2022**

**Agenda item:** 10.9.4.3

**Source:** Moderator (Nokia, Nokia Shanghai Bell)

**Title:** Email discussion summary for [102-e][321] NR\_HST\_FR2\_Demod\_Part2

**Document for:** Information

# Introduction

*Briefly introduce background, the scope of this email discussion (e.g. list of treated agenda items) and provide some guidelines for email discussion if necessary.*

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

* 1st round: TBA
* 2nd round: TBA

## Scope

This T-doc will be used to guide and summarize the email discussion for the topic of Rel-17 NR FR2 HST BS Demod requirements (AI 10.9.4.3), with the email thread identifier “[102-e][321] NR\_HST\_FR2\_Demod\_Part2”.

The scope of this email discussion are the Rel-17 NR FR2 HST BS Demod requirements, and in particular the agenda items:

10.9.4.3 BS demodulation requirements

10.9.4.3.1 PUSCH requirements

10.9.4.3.2 PUSCH with UL timing adjustment requirements

10.9.4.3.3 PRACH requirements

Priority topics are marked directly in the open issues’ summaries.

## Notes on email discussions

From the previous meeting arrangements:

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| --- |
| * Delegates are strongly encouraged to provide comments/concerns asap   + Silence within a reasonable timeframe means no objection * It is strongly encouraged that each company/delegate consolidate their comments/views and send them out in one email for each email thread * 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 |

# Topic #1: General

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

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-20xxxxx | Company A | Proposal 1:  Observation 1: |
| R4-2205755 | Huawei, HiSilicon | Title: Draft CR on HST FR2 BS applicability rule (38.141-2)  Moderator: draftCR |
| R4-2203542 | Samsung | Title: Simulation results summary for Rel-17 FR2 HST BS demod  Moderator: Simulation collection spreadsheet. Tdoc is only reserved and will be uploaded at the end of the meeting. |
| R4-2205034 | Ericsson | Title: On the OTA test setup CR for 38.141-2  **Observation 1**: No need for any draft CR for annex E of 38.131-2. |

## Open issues summary

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

*Interested companies are expected to add their views directly under the respective issues in a dialogue-like form, i.e., identical to how the chair would record views during a f2f meeting.*

*Please add further table rows as required and do not change previous comments of your company or other companies. Answering to questions from other companies is encouraged.*

### Sub-topic 1-1: CR drafting administration

*Sub-topic description:*

The CR split was agreed previously (see below for reminder).

This sub-topic will handle all questions and requests related to draftCR and bigCR administration.

|  |  |  |
| --- | --- | --- |
| **Section number** | **Section title** | **Responsible company** |
| **TS 38.104** | | |
|  | *Big CR* | Samsung |
| 11 | Radiated performance requirements | |
| 11.2 | Performance requirements for PUSCH | |
| 11.2.2 | Requirements for BS type 2-O | |
| *11.2.2.x* | *Requirements for PUSCH for high speed train* | *Intel* |
| *11.2.2.y* | *Requirements for UL timing adjustment* | *CATT* |
| 11.4 | Performance requirements for PRACH | |
| 11.4.2 | Requirements for BS type 2-O | |
| 11.4.2.2 | PRACH detection requirements | |
| *11.4.2.2.x* | *Minimum requirements for high speed train* | *Huawei* |
| *Annex A* | *Reference measurement channels* | *Intel* |
| *Annex G.3* | *High speed train condition* | *Nokia* |
| *Annex G.4* | *Moving propagation conditions* | *CATT* |
| **TS 38.141-2** | | |
|  | *Big CR* | *Nokia* |
| *4.6* | *Manufacturer's declarations* | *Samsung, Nokia* |
| 8 | Radiated performance requirements | |
| 8.1.2 | Applicability rule | |
| *8.1.2.4* | *Applicability of PUSCH for high speed train performance requirements* | *Huawei* |
| 8.2 | OTA performance requirements for PUSCH | |
| *8.2.4* | *Performance requirements for PUSCH for high speed train* | *Ericsson, Samsung* |
| *8.2.5* | *Performance requirements for UL timing adjustment* | *CATT* |
| 8.4 | OTA performance requirements for PRACH | |
| 8.4.1 | PRACH false alarm probability and missed detection | |
| *8.4.1.6* | *Test requirement for high speed train* | *Huawei* |
| *Annex A* | *Reference measurement channels* | *Intel* |
| *Annex E* | *OTA measurement system set-up* | *Ericsson* |
| *Annex J.3* | *High speed train condition* | *Nokia* |
| *Annex J.4* | *Moving propagation conditions* | *CATT* |

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

**Issue 1-1-1: BigCR reservation**

* Proposals
  + Option 1 (Moderator): No contributor has reserved tdoc for bigCRs.   
    Moderator to request tdoc number for email approval at the end of the first round for 38.104 bigCR (Samsung) and 38.141-2 bigCR (Nokia).
  + Other options not precluded
* Recommended WF
  + Option 1.

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| **Company** | **Comments** |
| XXX |  |

### Sub-topic 1-2: Other

*Sub-topic description:*

*In this sub-topic companies are invited to bring issues to the attention of the group, which have not been captured in the previous sub-topics.*

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

## 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** | *Tentative agreements:*  *Candidate options:*  *Recommendations for 2nd round:* |
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*Recommendations on WF/LS assignment*

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|  | **WF/LS t-doc Title** | **Assigned Company,**  **WF or LS lead** |
| #1 |  |  |
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### 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)

## Summary on 2nd round (if applicable)

*Moderator tries to summarize discussion status for 2nd round and provided recommendation on CRs/TPs/WFs/LSs Status update suggestion*

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| --- | --- |
| **CR/TP/LS/WF number** | **T-doc Status update recommendation** |
| XXX | *Based on 2nd round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |
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# Topic #2: PUSCH requirements

*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** |
| R4-20xxxxx | Company A | Title:  Proposal 1:  Observation 1: |
| [**R4-2203545**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2203545.zip) | Samsung | Title: Discussion and simulation results of PUSCH requirement for Rel-17 FR2 HST  Test Applicability rule for RS configuration  **Observation 1**: The overhead of 1DMRS +PTRS (L=1, K=2) configuration is the smallest compared with other RS configuration schemes.  **Observation 2**: Similar performance can be achieved for 2 DMRS configuration and 3 DMRS configuration.  **Observation 3**: Existing Rel-15 test applicability rule and BS manufacture with different RS configuration cannot guarantee Rel-17 FR2 HST BS test with more than 2 DMRS configuration.  **Observation 4**: The test is clearly defined non-HST scenario in Rel-15, in case both options (i.e., pos 0 and pos 1) are declared to be supported, the tests shall be done for pos 1  **Proposal 1: FR2 HST PUSCH requirement test shall apply only for the additional DM-RS position declared to be supported. If more than one DMRS configuration is declared to be supported, the test shall be done for the minimum number of DMRS supported**  **Proposal 2: RAN4 applies the following manufacturer on HST FR2 DM-RS supported**   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **D.1XX** | **PUSCH additional DM-RS positions** | **Declaration of the supported additional DM-RS position(s) for FR2 high speed train scenario, i.e., {pos0},{pos1},{pos2},{pos0,pos1}, {pos0 pos1}, {pos0,pos2}, {pos1,pos2} and all** | **n/a** | **n/a** | **x** |   MCS/Simulation results  **Observation 5**: Small performance gap between two kinds of FOC implementation methods for MCS 16 and MCS 17, around 2 or 3 dB difference between post-FFT and pre-FFT FOC methods for MCS 16 and MCS17.  Observation 6: Around 7dB difference between post-FFT and pre-FFT FOC methods for MCS 20  **Proposal 2: RAN4 apply only MCS 16 for PUSCH requirement with FR2 HST** |
| [**R4-2203971**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2203971.zip) | CATT | Title: Discussion on PUSCH demodulation requirements for FR2 HST  Test applicability  **Proposal 1: To adopt option 2 for test applicability.**  Manufacturer declaration  **Proposal 2: To adopt the following manufacturer declaration for different additional DM-RS position for FR2 HST.**   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **D.x** | **Additional DM-RS position for FR2 high speed train** | **Declaration of supported additional DM-RS position for FR2 high speed train scenario for PUSCH and UL timing adjustment, i.e., pos0, pos1, pos2.** | **n/a** | **n/a** | **x** |   MCS  **Proposal 3: To adopt Option 1(only MCS 20), or Option 4(only MCS16).** |
| [**R4-2203972**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2203972.zip) | CATT | Title: Simulation results for PUSCH demodulation requirements for FR2 HST  Moderator: Only simulation results. |
| [**R4-2204389**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2204389.zip) | Intel Corporation | Title: DraftCR to TS 38.104: FRC for HST FR2 PUSCH performance requirements  Moderator: draftCR |
| [**R4-2204390**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2204390.zip) | Intel Corporation | Title: DraftCR to TS 38.104: HST FR2 PUSCH performance requirements  Moderator: draftCR |
| [**R4-2204391**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2204391.zip) | Intel Corporation | Title: DraftCR to TS 38.141-2: FRC for HST FR2 PUSCH performance requirements  Moderator: draftCR |
| [**R4-2204392**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2204392.zip) | Intel Corporation | Title: HST FR2 PUSCH simulation results  Moderator: Simulation results  **Observation #1**: There is almost the same demodulation performance at 70% of max throughput with HST bi-directional and static channel model.  **Observation #2**: The performance in scenarios with 50MHz CBW is worse compared to the performance in scenarios with 20MHz CBW. |
| [**R4-2205023**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2205023.zip) | Ericsson | Title: HST PUSCH requirements  **Proposal 1: Adopt MCS20 for the PUSCH demodulation requirement** |
| [**R4-2205033**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2205033.zip) | Ericsson | Title: Draft CR on introduction of FR2 HST test procedure for PUSCH  Moderator: draftCR |
| [**R4-2205758**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2205758.zip) | Huawei, HiSilicon | Title: Discussion on PUSCH demodulation requirements for FR2 HST  Test applicability  **Proposal 1: If more than one DMRS configuration is declared to be supported, a pass with either of the possibilities is sufficient to demonstrate compliance to the core requirement.**  **Proposal 2: Add a note to the performance requirements as following to ensure that only one case is tested.**  **- Either pos 1, pos 2 or pos 3 may be used for the test FRC based on BS manufacturer declaration. A pass with either of these possibilities is sufficient to demonstrate compliance to the core requirement.**  Manufacturer declaration on HST FR2 DM-RS support – PUSCH  **Proposal 3: The wording of manufacturer declaration can be**  **- “Declaration of supported additional DM-RS position for FR2 high speed train scenario for PUSCH and UL timing adjustment, i.e., pos0, pos1, pos2.”**  **MCS**  **Proposal 4: Only one MCS should be selected, such as MCS20.**  Moderator: There was significant mismatch between observations/proposal in *Discussion* and *Proposal* summary sections of the tdoc. Moderator has tried to integrate both, even when incompatible.  Please check above result carefully.  To moderator: Sorry for the confusing. After double checking, we update our proposal with removing the version in our proposal summary that is for pervious meeting. |
| [**R4-2205965**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2205965.zip) | Nokia, Nokia Shanghai Bell | Title: On HST FR2 PUSCH Demodulation Requirements  On test applicability rules and manufacturer declarations  **Proposal 1: RAN 4 to describe manufacture declaration on HST FR2 DM-RS support as follows: “Declaration of the supported additional DM-RS position(s) for HST FR2 scenario, i.e., pos0, pos1, pos2, or any combinations of those.”**  **Observation 1**: If the test has passed with lower DM-RS density, then we can expect that it will be passed with higher density as well. However, passing of the test with high DM-RS density may not guaranty that the lower DM-RS density is sufficient.  **Proposal 2: RAN4 to base test applicability on Option 2, i.e., if more than one DM-RS configuration is declared to be supported, the test shall be done for the minimum number of DM-RS supported.**  On MCS requirements selection  **Observation 2**: Based on our results, there is no meaningful difference in PUSCH performance between the agreed HST FR2 channel model with a Doppler profile and simpler model with fixed Doppler offset.  **Proposal 3: Ideal and impairment results reported in Table 1 and Table 3 can be used for the simulation results alignment.**  **Proposal 4: Use MCS 20 only as a baseline. Change to lower MCS if SNR after requirement derivation is larger than 20dB or if there is a large span in the alignment results.** |

## Open issues summary

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

*Interested companies are expected to add their views directly under the respective issues in a dialogue-like form, i.e., identical to how the chair would record views during a f2f meeting.*

*Please add further table rows as required and do not change previous comments of your company or other companies. Answering to questions from other companies is encouraged.*

### Sub-topic 2-1: Test applicability rules and manufacturer declarations

*Sub-topic description:*

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

**Issue 2-1-1: Test applicability**

* Proposals
  + Option 1 (Huawei): If more than one DMRS configuration is declared to be supported, a pass with either of the possibilities is sufficient to demonstrate compliance to the core requirement.  
    Add a note to the performance requirements as following to ensure that only one case is tested.
    - Either pos 1, pos 2 or pos 3 may be used for the test FRC based on BS manufacturer declaration. A pass with either of these possibilities is sufficient to demonstrate compliance to the core requirement.
  + Option 2 (Samsung, CATT, Nokia): FR2 HST PUSCH requirement test shall apply only for the additional DM-RS position declared to be supported.   
    If more than one DMRS configuration is declared to be supported, the test shall be done for the minimum number of DMRS supported.
  + Other options not precluded
* Recommended WF
  + Option 2 has majority. Select option 2.

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

**Issue 2-1-2: Wording of manufacturer declaration on HST FR2 DM-RS support**

* Prior agreements
  + [R4-2203006]:
    - Manufacturer declaration on HST FR2 DM-RS support – UL TA
      * Share the same manufacturer declaration with PUSCH.
* Proposals
  + Option 1 (Samsung): To adopt the following manufacturer declaration for different additional DM-RS position support for FR2 HST.
    - PUSCH additional DM-RS positions:   
      Declaration of the supported additional DM-RS position(s) for FR2 high speed train scenario, i.e., {pos0},{pos1},{pos2},{pos0,pos1}, {pos0 pos1}, {pos0,pos2}, {pos1,pos2} and all.
  + Option 2 (CATT, Huawei): To adopt the following manufacturer declaration for different additional DM-RS position support for FR2 HST.
    - Additional DM-RS position for FR2 high speed train:   
      Declaration of supported additional DM-RS position for FR2 high speed train scenario for PUSCH and UL timing adjustment, i.e., pos0, pos1, pos2.
  + Option 3 (Nokia): To adopt the following manufacturer declaration for different additional DM-RS position support for FR2 HST:
    - Declaration of the supported additional DM-RS position(s) for HST FR2 scenario, i.e., pos0, pos1, pos2, or any combinations of those.
  + Option 4 (Moderator) To adopt the following manufacturer declaration for different additional DM-RS position support for FR2 HST.
    - Additional DM-RS position for FR2 high speed train:   
      Declaration of supported additional DM-RS position(s) for FR2 high speed train scenario for PUSCH and UL timing adjustment, i.e., pos0, pos1, pos2, or any combination.
  + Other options not precluded
* Recommended WF
  + All proposals seem to be aligned in their technical intent.  
    Option 2 has majority.
  + Agree with option 2 or moderator proposed option 4, which aims to merge the “position**(s)**” and “**any combination**” explicit highlighting from option 1 and 3 into option 2.

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| **Company** | **Comments** |
| XXX |  |

### Sub-topic 2-2: MCS selection

*Sub-topic description:*

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

**Issue 2-2-1: MCS**

* Proposals
  + Option 1 (CATT, Ericsson, Huawei, Nokia): Only MCS 20.
  + Option 2 (Samsung, CATT): Only MCS 16.
  + Option 3 (Nokia): Use MCS 20 only as a baseline. Change to lower MCS if SNR after requirement derivation is larger than 20dB or if there is a large span in the alignment results.
  + Other options not precluded
* Recommended WF
  + Option 3 could be a compromise, but define what constitutes a large span.
    - Moderator proposal: Use same span as ideal span threshold for requirement derivation [R4-1904713] [R4-19004714], i.e., 2dB, or extended 2.5dB.

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| **Company** | **Comments** |
| XXX |  |

### Sub-topic 2-3: Requirement selection

*Sub-topic description:*

In the last meeting, a very large span was still observed in PUSCH simulation results; especially at higher MCS. It was unclear if all this gap is due to post-FFT vs. pre-FFT implementation, or due to other influences.  
To improve alignment, interested companies were invited to voluntarily bring results for AWGN + fixed maximum Doppler offset of 19458 Hz (without bi-directional propagation channel), at least for the test case {Post-FFT/[Pre-FFT]; Type B, 10 Symbols, 120kHz/200MHz; MCS20; DM-RS 1+1}. The results are for alignment only and not intended for deriving the requirement.

The following results were shared [dB SNR@70%TPUT]:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Configuration | FOC | Huawei R4-2205758 | Nokia R4-2205965 | Intel R4-2204392 | Ericsson R4-2205023 |  |
| PUSCH Type B, 10 Symbols, 120kHz/200MHz; MCS20; DM-RS 1+1  AWGN + fixed maximum Doppler offset of 19458 Hz | **Post-FFT** | 11.25 | 9.96 | 12.0 | 11.2 |  |
| **Pre-FFT** | 9.33 | 9.26 |  | 9.4 |  |
|  |  |  |  |  |  |

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

**Issue 2-3-1: Requirement selection**

* Prior agreements
  + [R4-2203006]
    - MCS selection: Receiver baseline assumption for simulation
      * Assume a receiver with post FFT FOC.
* Proposals
  + Option 1 (Moderator): Apply standard requirement selection to (post-FFT) results with outlier selection, as in Rel-15 [R4-1904713] [R4-19004714]. Choose ideal result alignment threshold as 2.5dB, and impairment threshold as 4dB.
  + Other options not precluded.
* Recommended WF
  + For the static FO test, the contributing companies are aligned within 2.29dB in post-FFT, and within 0.14 dB for pre-FFT. Post-FFT is worse in terms of performance than pre-FFT.
  + All companies are very much invited to update their simulation results in the simulation summary in the draft folder, so we can evaluate if large misalignment is still present.
  + Discuss in first round.

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| **Company** | **Comments** |
| XXX |  |

### Sub-topic 2-4: Other

*Sub-topic description:*

*In this sub-topic companies are invited to bring issues to the attention of the group, which have not been captured in the previous sub-topics.*

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

### CRs/TPs comments collection

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

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| --- | --- |
| **CR/TP number** | **Comments collection** |
| XXX | Title, Source |
| Company A |
| Company B |
|  |
| R4-2204389 | DraftCR to TS 38.104: FRC for HST FR2 PUSCH performance requirements, Intel |
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| R4-2204390 | DraftCR to TS 38.104: HST FR2 PUSCH performance requirements, Intel |
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| R4-2204391 | DraftCR to TS 38.141-2: FRC for HST FR2 PUSCH performance requirements, Intel |
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| R4-2205033 | Draft CR on introduction of FR2 HST test procedure for PUSCH, Ericsson |
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## Summary for 1st round

### Open issues

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

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

*Recommendations on WF/LS assignment*

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| --- | --- | --- |
|  | **WF/LS t-doc Title** | **Assigned Company,**  **WF or LS lead** |
| #1 |  |  |
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### 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.*

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

## Discussion on 2nd round (if applicable)

## Summary on 2nd round (if applicable)

*Moderator tries to summarize discussion status for 2nd round and provided recommendation on CRs/TPs/WFs/LSs Status update suggestion*

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| **CR/TP/LS/WF number** | **T-doc Status update recommendation** |
| XXX | *Based on 2nd round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |
|  |  |

# Topic #3: PUSCH with UL timing adjustment requirements

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

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-20xxxxx | Company A | Title:  Proposal 1:  Observation 1: |
| [**R4-2203546**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2203546.zip) | Samsung | Title: Simulation results of UL timing adjustment requirement for Rel-17 FR2 HST  Moderator: Only simulation results. |
| [**R4-2203973**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2203973.zip) | CATT | Title: Simulation results for UL timing adjustment demodulation requirements for FR2 HST  Moderator: Only simulation results. |
| [**R4-2204393**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2204393.zip) | Intel Corporation | Title: HST FR2 UL TA simulation results  Moderator: Only simulation results. |
| [**R4-2205759**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2205759.zip) | Huawei, HiSilicon | Title: Simulation results on PUSCH with UL timing adjustment requirements for FR2 HST  Moderator: Only simulation results. |
| [**R4-2205963**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2205963.zip) | Nokia, Nokia Shanghai Bell | Title: HST FR2 PUSCH UL TA Impairment Simulation Results  Moderator: Only simulation results.  **Proposal 1: Use the impairment results in the table above for the alignment of PUSCH UL Timing Adjustment demodulation performance requirements.** |

## Open issues summary

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

*Interested companies are expected to add their views directly under the respective issues in a dialogue-like form, i.e., identical to how the chair would record views during a f2f meeting.*

*Please add further table rows as required and do not change previous comments of your company or other companies. Answering to questions from other companies is encouraged.*

Only simulation tdocs were submitted to this AI.  
No open issues were recorded in last meeting’s WF.

No draftCRs were received. Every entity with CR responsibility, is invited to bring draftCRs to the next meeting

### Sub-topic 3-1: Other

*Sub-topic description:*

*In this sub-topic companies are invited to bring issues to the attention of the group, which have not been captured in the previous sub-topics.*

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

### 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** |
| XXX | Title, Source |
| Company A |
| Company B |
|  |
| None |  |
|  |
|  |
|  |

## Summary for 1st round

### Open issues

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

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

*Recommendations on WF/LS assignment*

|  |  |  |
| --- | --- | --- |
|  | **WF/LS t-doc Title** | **Assigned Company,**  **WF or LS lead** |
| #1 |  |  |
|  |  |  |

### 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)

## Summary on 2nd round (if applicable)

*Moderator tries to summarize discussion status for 2nd round and provided recommendation on CRs/TPs/WFs/LSs Status update suggestion*

|  |  |
| --- | --- |
| **CR/TP/LS/WF number** | **T-doc Status update recommendation** |
| XXX | *Based on 2nd round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |
|  |  |

# Topic #4: PRACH requirements

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

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-20xxxxx | Company A | Title:  Proposal 1:  Observation 1: |
| [**R4-2203547**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2203547.zip) | Samsung | Title: Simulation results of PRACH requirement for Rel-17 FR2 HST  Moderator: Only simulation results. |
| [**R4-2203974**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2203974.zip) | CATT | Title: Simulation results for PRACH demodulation requirements for FR2 HST  Moderator: Only simulation results. |
| [**R4-2204394**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2204394.zip) | Intel Corporation | Title: HST FR2 PRACH simulation results  Moderator: Only simulation results. |
| [**R4-2205760**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2205760.zip) | Huawei, HiSilicon | Title: Simulation results on PRACH demodulation requirements for FR2 HST  Moderator: Only simulation results. |
| [**R4-2205761**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2205761.zip) | Huawei, HiSilicon | Title: Draft CR on PRACH minimum requirements for high speed train (38.104)  Moderator: draftCR |
| [**R4-2205762**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2205762.zip) | Huawei, HiSilicon | Title: Draft CR on PRACH test requirement for high speed train (38.141-2)  Moderator: draftCR |
| [**R4-2205964**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2205964.zip) | Nokia, Nokia Shanghai Bell | Title: HST FR2 PRACH Impairment Simulation Results  Moderator: Only simulation results.  **Proposal 1: Use the impairment results in the table above for the alignment PRACH requirements.** |

## Open issues summary

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

*Interested companies are expected to add their views directly under the respective issues in a dialogue-like form, i.e., identical to how the chair would record views during a f2f meeting.*

*Please add further table rows as required and do not change previous comments of your company or other companies. Answering to questions from other companies is encouraged.*

Only simulation tdocs were submitted to this AI.  
No open issues were recorded in last meeting’s WF.

Please **check the submitted draftCRs**.

### Sub-topic 4-1: Other

*Sub-topic description:*

*In this sub-topic companies are invited to bring issues to the attention of the group, which have not been captured in the previous sub-topics.*

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

### 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** |
| XXX | Title, Source |
| Company A |
| Company B |
|  |
| R4-2205761 | Draft CR on PRACH minimum requirements for high speed train (38.104), Huawei |
|  |
|  |
|  |
| R4-2205762 | Draft CR on PRACH test requirement for high speed train (38.141-2), Huawei |
|  |
|  |
|  |

## Summary for 1st round

### Open issues

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

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

*Recommendations on WF/LS assignment*

|  |  |  |
| --- | --- | --- |
|  | **WF/LS t-doc Title** | **Assigned Company,**  **WF or LS lead** |
| #1 |  |  |
|  |  |  |

### 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)

## Summary on 2nd round (if applicable)

*Moderator tries to summarize discussion status for 2nd round and provided recommendation on CRs/TPs/WFs/LSs Status update suggestion*

|  |  |
| --- | --- |
| **CR/TP/LS/WF number** | **T-doc Status update recommendation** |
| XXX | *Based on 2nd round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |
|  |  |

# 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 |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

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

# Annex

Contact information

|  |  |  |
| --- | --- | --- |
| **Company** | **Name** | **Email address** |
| Moderator (Nokia, Nokia Shanghai Bell) | Axel Mueller | axel.mueller@nokia-bell-labs.com |
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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 your name as suffix after company name, when making comments, i.e. Company A (XX, XX).