3GPP TSG-RAN WG1 Meeting #103-e Tdoc R1-200xxxx

e-Meeting, August 17th – 28th, 2020

**Agenda Item: 8.6**

**Title: FL summary on RedCap evaluation results**

**Source: Moderator (Ericsson, Apple, Qualcomm)**

**Document for: Discussion, Decision**

# 1 Introduction

This FL summary captures RAN1#103-e email discussion [103-e-NR-RedCap-EvaluationResults] for collection of RedCap evaluation results. The following working directory is used during the email discussion:

<https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_103-e/Inbox/drafts/8.6/EvaluationResults/>

Initial collection of RedCap evaluation results were captured in [R1-2007482](https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_102-e/Docs/R1-2007482.zip), following a discussion on the spreadsheet templates captured in [R1-2007476](https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_102-e/Docs/R1-2007476.zip), [R1-2007477](https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_102-e/Docs/R1-2007477.zip), [R1-2007478](https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_102-e/Docs/R1-2007478.zip) and [R1-2007481](https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_102-e/Docs/R1-2007481.zip), where the two last ones ([R1-2007478](https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_102-e/Docs/R1-2007478.zip), [R1-2007481](https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_102-e/Docs/R1-2007481.zip)) provided guidance for how to fill out the templates.

This discussion document contains some instructions and comment fields. Entering comments in the discussion document is optional. The intention with the comment fields in the discussion document is to provide a place where comments can be entered other than in the spreadsheets, since if a lot of comments are entered in the comment fields in the spreadsheets, the spreadsheets might become rather bloated. So, please use the comment fields in the spreadsheets sparingly and enter any additional comments that you might have in the discussion document. In the end, the discussion document and spreadsheets will all be included in a single Tdoc.

Follow the naming convention in this example:

* *RedCapCost-v000.xlsx*
* *RedCapCost-v001-CompanyA.xlsx*
* *RedCapCost-v002-CompanyA-CompanyB.xlsx*
* *RedCapCost-v003-CompanyB-CompanyC.xlsx*

If needed, you may “lock” a spreadsheet file for 30 minutes by creating a “dot-checkout” file, as in this example:

* Assume CompanyC wants to update *RedCapCost-v002-CompanyA-CompanyB.xlsx* but needs some time.
* CompanyC uploads a (preferably empty) file named *RedCapCost-v003-CompanyB-CompanyC.checkout*
* CompanyC then has 30 minutes to upload its update in *RedCapCost-v003-CompanyB-CompanyC.xlsx*
* If no update is uploaded in 30 minutes, other companies can ignore the .checkout file.
* Note that the file timestamps on the server are in UTC time.

# 2 Cost reduction evaluation

Companies are invited to provide their evaluation results in the spreadsheet in this folder:

<https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_103-e/Inbox/drafts/8.6/EvaluationResults/RedCapCost/>

Any additional comments can be provided below.

|  |  |
| --- | --- |
| **Company** | **Comments on cost reduction evaluation** |
| Samsung | For combination, we think it should base on similar method for calculation in MTC, i.e., for each component, a%\*b%/% of the component, were a% and b% are the number of the component of combined techniques. In the uploaded excel, we add equations for most of table. I think each company can use the equations to generate the combined cost reduction and adjust it if the gain can be linearly added or some other way. If we all agree on the above method, we think the cost analysis can be based on averaged results for each feature (by FL ☺) |
| Huawei, HiSilicon | * For combination, we base on a similar calculation methodology as Samsung.
* We think each sourcing results shall be used for their estimate of combinations, and the combination estimate shall be provided together with the cost estimate of individual techniques. The main reason of not using FL averaging results is it already potentially hide some specialized implementation and cannot reflect the UE flexibility and potential of cost saving that could be achieved.
* For the cost estimate of individual/combination technique(s) raised with questions, there are different cases we may need to handle differently.
	+ Values with large difference are possible due to different implementations, thus may not change the relevant observations, e.g.
		- For Rx reduction, whether the PA will be impacted
		- Whether the cost saving of Transceiver can be more than 1/3 from the reference number (i.e. 45%-> around 30%) when 1T2R->1T1R in FDD.
		- If they are understood so, we can live with those as different UE implementations.
	+ Values with large difference are based on potential mis-calculation and potentially can lead to different observations among results, e.g.
		- For FDD HD-FDD vs reference UE, when replacing a duplexer (20% cost) integrated with T/R filter inside (10% cost, similar to the Filter block outside the duplexer) by a switch, the cost saving cannot be reduced down to less than 10% due to the remains of filters inside, in order to keep 1Tx&2Rx.
		- This high proportion of cost saving exceed the theoretical value that is possible based on the template, thus shall be clarified before endorsement or being used for drawing observations.
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# 3 Power saving evaluation

Companies are invited to provide their evaluation results in the spreadsheet in this folder:

<https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_103-e/Inbox/drafts/8.6/EvaluationResults/RedCapPower/>

Any additional comments can be provided below.

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| **Company** | **Comments on power saving evaluation** |
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# 4 Coverage recovery evaluation

Companies are invited to provide their evaluation results in the spreadsheets in these folders:

<https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_103-e/Inbox/drafts/8.6/EvaluationResults/RedCapCoverage/700MHz/>

<https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_103-e/Inbox/drafts/8.6/EvaluationResults/RedCapCoverage/2.6GHz/>

<https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_103-e/Inbox/drafts/8.6/EvaluationResults/RedCapCoverage/4GHz/>

<https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_103-e/Inbox/drafts/8.6/EvaluationResults/RedCapCoverage/28GHz/>

Any additional comments can be provided below.

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| **Company** | **Comments on coverage recovery evaluation** |
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# 5 Capacity impact evaluation

Companies are invited to provide their evaluation results in the spreadsheet in this folder:

<https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_103-e/Inbox/drafts/8.6/EvaluationResults/RedCapCapacity/>

Any additional comments can be provided below.

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| **Company** | **Comments on capacity impact evaluation** |
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