**3GPP TSG RAN Meeting #90-eRP-20xxxx**

**Electronic Meeting, December 7 - 11, 2020**  *revision of RP-202053*

**Agenda item:** **9.8.19**

**Source: Apple**

**Title: Revised WID of REL-17 NR RRM further enhancement**

**Document for:** **Approval**

3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](http://www.3gpp.org/specifications-groups/working-procedures), article 39; and [3GPP TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm).  
Information about Work Items can be found at <http://www.3gpp.org/Work-Items>

# Title: Further RRM enhancement for NR and MR-DC

## Acronym: NR\_RRM\_enh2

## Unique identifier:

NOTE: For new WIs/SIs leave the Unique identifier empty or you can make a proposal for an Acronym.

If this is a RAN WID including Core and Perf. part, then Title, Acronym and Unique identifier refer to the feature WI.

Please tick (X) the applicable box(es) in the table below:

Either:

|  |  |
| --- | --- |
| **This WID includes a Core part** | **X** |
| **This WID includes a Performance part** | **X** |

or:

|  |  |  |
| --- | --- | --- |
| **This WID includes a Testing part** | |  |
| **and it addresses the following 3GPP work area:** | **Radio Access** |  |
| **Core Network** |  |
| **Services** |  |

## 1 Impacts

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Affects:** | UICC apps | ME | AN | CN | Others (specify) |
| **Yes** |  | X |  |  |  |
| **No** | X |  | X | X | X |
| **Don't know** |  |  |  |  |  |

## 2 Classification of the Work Item and linked work items

### 2.1 Primary classification

This work item is a … *{Tick one box. "***Feature** */* **Building Block** */ Work Task" form a hierarchical structure. E.g. no Building Block can be proposed without a corresponding parent Feature. The full structure of all existing Work Items is shown in the 3GPP Work Plan in* [*ftp://ftp.3gpp.org/Information/WORK\_PLAN*](ftp://ftp.3gpp.org/Information/WORK_PLAN) *}*

|  |  |
| --- | --- |
| X | Feature |
|  | Building Block |
|  | *Work Task* |
|  | Study Item |

NOTE: Normally, Core/Perf./Testing parts in RAN WIDs are Building Blocks. Only if they are under an SA or CT umbrella, we define them as work tasks. If you are in doubt, please contact MCC.

### 2.2 Parent and child Work Items

*{For a* **Feature***: list here the children* **Building Blocks** *(optional) and* Work Tasks *(optional)}*

*{For a* **Building Block***: list here the parent* **Feature** *(mandatory) and children* Work Tasks *(optional)}*

*{For a* Work Task*: list here the parent* **Building Block** *(mandatory)}*

|  |  |  |
| --- | --- | --- |
| Parent and child Work Items | | |
| Unique ID | Title | Nature of relationship |
|  |  | *{mandatory text: "parent WID" or "child WID"}* |

NOTE: RAN agreed some time ago, that it describes the feature WI + Core/Perf. part WI or Testing part WI in one WID. Therefore the table above should just include the feature WI Unique ID and title and Nature of relationship is "parent WID".

### 2.3 Other related Work Items and dependencies

*{List here other Work Items which relate to the proposed one but are not part of the hierarchical structure, such as preceding SI or a preceding WI (e.g. if you further enhance a topic).}*

|  |  |  |
| --- | --- | --- |
| Other related Work Items (if any) | | |
| Unique ID | Title | Nature of relationship |
|  |  |  |

NOTE: Also related or dependent WIs in other TSGs should be indicated.

## 3 Justification

* SRS antenna port switching
  + In NR system the SRS antenna port switching is supported in the RAN1 and RAN2 specs, and the capability is defined in TS38.306. However, the SRS antenna port switching requirement is missing in RAN4 RRM.
* HO with PSCell
  + In Rel-16 RAN2 has introduced support of HO from NR SA to EN-DC, as indicated in LS R2-1916600. Besides the inter-RAT HO, RAN2 has also supported intra-RAT HO with PSCell. The corresponding RRM requirements for these procedures are also missing.
* PUCCH SCell activation
  + From release 15 NR, the two PUCCH groups are optionally supported by the UE. However, the PUCCH SCell activation requirement is missing in RAN4 RRM.
* Leftover issue from CSI-RS L3 measurement
  + The timing limitation for CSI-RS L3 measurement is specified as a requirement applicability in RAN4, but it’s not a real systematic solution for network and UE to configure and perform L3 CSI-RS measurement, respectively. It’s desirable to introduce clear timing window for L3 CSI-RS measurement, like SMTC for SSB based L3 measurement, i.e., CMTC (CSI-RS measurement timing configuration).

In this RAN4 NR RRM further enhancement WI, the identified issues for core requirement would be addressed, and corresponding performance requirements and test cases would be covered.

## 4 Objective

### 4.1 Objective of Core part WI

The objective of this work item is to specify NR RRM further enhancement requirements for REL-17

1. SRS antenna port switching [RAN4]
   * Specify RRM requirement for SRS antenna port switching, e.g.
     + Interruption requirement
     + Potential impact on other RRM requirements
2. HO with PSCell [RAN4]
   * Determine the scenarios for HO with PSCell for which RRM requirements are to be specified
     + from NR SA to EN-DC
     + from EN-DC to EN-DC
     + from NE-DC to NE-DC
     + from NR-DC to NR-DC
   * Study the UE behavior for HO with PSCell
     + Existing requirements for HO and PSCell addition as baseline
     + Timeline and interaction between HO and PSCell addition
   * Specify RRM requirements for HO with PSCell based on agreed UE behavior
3. PUCCH SCell activation/deactivation [RAN4]
   * Specify SCell Activation Delay Requirement for Deactivated PUCCH SCell (including valid TA and invalid TA)
   * Specify SCell Activation Delay Requirement for Deactivated PUCCH SCell with Multiple SCells (including valid TA and invalid TA)
   * Specify SCell Deactivation Delay Requirement for Activated PUCCH SCell
   * Specify SCell Deactivation Delay Requirement for Activated PUCCH SCell with Multiple SCells.
4. CSI-RS L3 measurement enhancement [RAN4, RAN2]
   * CMTC for CSI-RS L3 measurement [RAN4, RAN2]
     + RRM requirement based on CMTC for CSI-RS L3 measurement
     + Signalling design for CMTC of CSI-RS L3 measurement

### 4.2 Objective of Performance part WI

Specify the RRM performance requirements and test cases related to new core requirements

### 4.3 RAN time budget request (not applicable to RAN5 WIs/SIs)

NOTE: For all new RAN related WIs/SIs which are not led by RAN WG5 the WI/SI rapporteur has to fill out the attached Excel table to request time budgets for corresponding RAN WG meetings.  
The Excel table has to be filled out for all affected RAN WGs and up to the target date of the WI/SI.  
One time unit (TU) corresponds to ~ 2 hours in the meeting.  
If no TU is needed leave the field empty otherwise enter a number >0 in the field.

For revisions of already approved WI/SI descriptions: Please remove the Excel table from the WID/SID's zip file. The time budgets are already recorded. If you want to modify them, then this has to be done via the status report and not via a revised WID/SID.

If this WID is covering Core and Performance part, then please fill out one line for each part in the attached Excel table.

**additional comments to the time budget request in the attached Excel table:**

## 5 Expected Output and Time scale

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **New specifications** *{One line per specification. Create/delete lines as needed}* | | | | | |
| Type | Series | Title | For info  at TSG# | For approval at TSG# | Remarks |
| *{Possible values:*  *"TS" or*  *"Internal TR" or*  *"External TR". See Note 1}* | *{E.g.*  *"22.XXX"}* | *{Title of the specification (as per TR 21.801 §6.1.1), to be aligned as much as possible with the WI/SI title}* | *{E.g.*  *"TSG#87"}* | *{E.g.*  *"TSG#89"}* | *{e.g.: rapporteur:*  *<FamilyName>, <GivenName>, <Company>, <email address>. See Note 2}* |

*{Note 1: Only TSs may contain normative provisions. Study Items shall create or impact only TRs.  
"Internal TR" is intended for 3GPP internal use only whereas "External TR" may be transposed by OPs.}*

NOTE: If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Remarks for each spec.  
By default a new specs can only be new for one of both parts.

|  |  |  |  |
| --- | --- | --- | --- |
| **Impacted existing TS/TR** *{One line per specification. Create/delete lines as needed}* | | | |
| TS/TR No. | Description of change | Target completion plenary# | Remarks |
| TS38.133 | Core requirement for RRM enhancement | RAN #93 | Core part |
| TS38.133 | Performance requirement and test cases for RRM enhancement | RAN #95 | Performance part |
| TS36.133 | Core requirement for RRM enhancement | RAN #93 | Core part |
| TS36.133 | Performance requirement and test cases for RRM enhancement | RAN #95 | Performance part |

NOTE: If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Remarks for each spec.  
If an existing spec is affected by both (Core part and Perf. part), then it has to be listed twice with appropriate approval dates.

## 6 Work item Rapporteur(s)

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## 7 Work item leadership

RAN WG4

## 8 Aspects that involve other WGs

*{Specify all the other WG(s) to be involved and, if necessary, their task. E.g.: "SA2, SA3, SA5. CT6 for storage, and potentially SA4". If not applicable, indicate "None" or "None identified yet".}*

NOTE: For RAN WIDs: Section 8 applies only to WGs outside of TSG RAN because RAN WG aspects have to be covered in section 4.

## 9 Supporting Individual Members

*{At least 4 supporting Individual Members are needed. There is an expectation that these companies will provide resources to progress the work. Note that having 4 supporting companies is a necessary but not sufficient condition: the usual TSG approval process by consensus is needed for the WID approval.}*

|  |
| --- |
| Supporting IM name |
| Apple |
| Intel |
| OPPO |
| China Telecom |
| Xiaomi |
| Qualcomm |
| vivo |
| CMCC |
| ZTE |
| Huawei |
| HiSilicon |
| Ericsson |
| Samsung |
| Nokia |
| Nokia Shanghai Bell |
| Verizon |
| LGE |
| CATT |
| Mediatek |
|  |