**3GPP TSG RAN Meeting #94e RP-213559**

**Electronic Meeting, Dec. 6 - 17, 2021**

**Source: Ericsson**

**Title: New WI: Enhancement of NR Dynamic spectrum sharing (DSS)**

**Document for: Approval**

**Agenda Item: 8A.1**

3GPP™ Work Item Description

Information on Work Items can be found at <http://www.3gpp.org/Work-Items>
See also the [3GPP Working Procedures](http://www.3gpp.org/specifications-groups/working-procedures), article 39 and the TSG Working Methods in [3GPP TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm)

# Title: Enhancement of NR Dynamic spectrum sharing (DSS)

## Acronym: NR\_DSS\_enh

## Unique identifier:

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

 For a revised WI/SI: Take Unique identifier and acronym as shown in 3GPP workplan.

 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** |  |

Potential target Release: Rel-18

Note that this field above indicates the proposed Release at the time of submission of the WID to TSG approval. It can later be changed without a need to revise the WID. The updated target Release is indicated in the Work Plan. NOTE: In case of contradiction with the target dates of clause 5, clause 5 determines the target release.

## 1 Impacts

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Affects:** | UICC apps | ME | AN | CN | Others (specify) |
| **Yes** |  | X | X |  |  |
| **No** | 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

|  |  |
| --- | --- |
| 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, they are defined as work tasks. If you are in doubt, please contact MCC.

### 2.2 Parent Work Item

|  |
| --- |
| Parent Work / Study Items  |
| Acronym | Working Group | Unique ID | Title (as in 3GPP Work Plan) |
|  |  |  |  |

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 data (In case the feature covers Core and Perf. part, please list under Working Group the leading WG of the Core part).

### 2.3 Other related Work Items and dependencies

|  |
| --- |
| Other related Work Items (if any) |
| Unique ID | Title | Nature of relationship |
| 860043 | WID on NR Dynamic spectrum sharing | Rel-17 work item for DSS. |

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

**Dependency on non-3GPP (draft) specification**:

## 3 Justification

LTE UEs are likely to be around for a long time and hence it is important to continue to evolve DSS (dynamic spectrum sharing, or LTE-NR coexistence), especially there are room for performance improvements in scenarios where NR traffic starts to dominate with very low traffic.

NR PDCCH would be a bottleneck of DSS and the situation will become worse with NR traffic increasing, because the current specification does not allow more than one NR PDCCH symbols within the first 3 symbols of a slot in cells with four LTE CRS ports. To maximize the resource utilization and increase the PDCCH capacity for DSS, it would be beneficial to allow NR PDCCH reception in symbols overlapping with LTE CRS.

Transmission of LTE CRS from neighboring LTE cells can cause interference to NR cells. In order to mitigate this interference, it would be useful to have multiple LTE CRS rate matching patterns. However, currently two overlapping LTE rate matching patterns are only supported together with support and configuration of multi-TRP transmissions.

## 4 Objective

### 4.1 Objective of SI or Core part WI or Testing part WI

The following objectives shall be included for improvement of NR spectrum efficiency for LTE-NR co-existence (RAN1):

* Study and if needed specify NR PDCCH reception in symbols with LTE CRS REs. [RAN1]
	+ Investigate enabling LTE CRS to puncture NR PDCCH, including the impact to NR PDCCH DMRS if there is the performance gain from the additional PDCCH resources.
* Allow a UE to support, and be configured with, two overlapping CRS rate matching patterns regardless of support or configuration of multi-TRP [RAN1]

### 4.2 Objective of Performance part WI

NOTE: Leave empty if the WI proposal does not contain a RAN performance part.

Specify, if any, necessary UE performance requirements for above core objectives:

* Specify necessary UE demodulation performance requirements (RAN4)

### 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, then 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** |
| Type  | TS/TR number | Title | For info at TSG#  | For approval at TSG# | Remarks |
|  |  |  |  |  |  |

NOTE: If this is a RAN WI 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** |
| TS/TR No. | Description of change  | Target completion plenary# | Remarks |
| 38.211 | Add Physical channels and modulation | #101 | Core Part |
| 38.213 | Add impacts on 38.213 Physical layer procedures for control, if needed | #101 | Core part |
| 38.214 | Add impacts on 38.214 Physical layer procedures for data, if needed | #101 | Core part |
| 38.306 | Add impacts on 38.306 User Equipment (UE) radio access capabilities, if needed | #102 | Core part |
| 38.331 | Add impacts on 38.331 Radio Resource Control (RRC) Protocol specification, if needed | #102 | Core part |
| 38.101-4 | Add UE demodulation performance requirements | #104 | Perf. part |
|  |  |  |  |

NOTE: If this is a RAN WI 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)

Nory, Ravikiran; Ericsson; ravikiran.nory@ericsson.com

## 7 Work item leadership

Primary: RAN1

Secondary: RAN2, RAN4

## 8 Aspects that involve other WGs

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

## 9 Supporting Individual Members

|  |
| --- |
| Supporting IM name |
| CAICT |
| CATT |
| China Telecom |
| Continental Automotive |
| Ericsson |
| Intel |
| LG Electronics |
| Orange |
| Samsung |
| Sanechips |
| SoftBank |
| Telia Company |
| Telstra |
| vivo |
| Vodafone |
| ZTE Corporation |