**3GPP TSG-RAN WG4 Meeting # 100-e R4-2113694**

**Electronic Meeting, Aug. 16-27, 2021** (Revision of RP-211319)

**Source: Nokia, Nokia Shanghai Bell**

**Title: Revised Rel-17 WID on DC of 4 bands LTE inter-band CA (4DL1UL) and 1 NR band (1DL1UL)**

**Document for: Approval**

**Agenda Item: 8.17.1**

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: Rel-17 Dual Connectivity (DC) of 4 bands LTE inter-band CA (4DL/1UL) and 1 NR band (1DL/1UL)

## Acronym: DC\_R17\_4BLTE\_1BNR\_5DL2UL

## Unique identifier: 881001

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

## Potential target Release: Rel-17

## 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 …

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

### 2.2 Parent Work Item

|  |  |  |  |
| --- | --- | --- | --- |
| Parent Work / Study Items | | | |
| Acronym | Working Group | Unique ID | Title (as in 3GPP Work Plan) |
| DC\_R17\_4BLTE\_1BNR\_5DL2UL | RAN4 | 881001 | Rel-17 Dual Connectivity (DC) of 4 bands LTE inter-band CA (4DL/1UL) and 1 NR band (1DL/1UL) |

### 2.3 Other related Work Items and dependencies

*{List here other Work Items which relate to the proposed one, such as preceding SI or a preceding WI (e.g. if further enhancing a feature).}*

|  |  |  |
| --- | --- | --- |
| Other related Work Items (if any) | | |
| Unique ID | Title | Nature of relationship |
| 881101 | Core part: Rel-17 Dual Connectivity (DC) of 4 bands LTE inter-band CA (4DL/1UL) and 1 NR band (1DL/1UL) | Child WID |
| 881201 | Perf. part: Rel-17 Dual Connectivity (DC) of 4 bands LTE inter-band CA (4DL/1UL) and 1 NR band (1DL/1UL) | Child WID |

## 3 Justification

All new EN-DC and NE-DC configurations consisting of 5 different bands DL with 2 different bands UL (4 different LTE bands and 1 NR band) will be defined under this WI. New configurations still emerge from exiting bands and whenever new band is specified, it will create a potential for several new EN-DC and NE-DC configurations consisting of 5 different bands DL with 2 different bands UL (4 different LTE bands and 1 NR band).

The EN-DC and NE-DC configurations will be introduced in a release independent manner from Rel-15 based on TS38.307, which will be updated depending on newly introduced configurations.

The preconditions to propose 5 different bands DL with 2 different bands UL (4 different LTE bands and 1 NR band) in rel-17 are as follows.

* Constituent LTE inter band CA including intra band CA for 4 different bands DL with 1 band UL shall be completed and specified in advance.
* Each of the four paired EN-DC configurations of 1 LTE band including intra band CA + 1 NR band used in a certain 5 different bands DL with 2 different bands UL shall be completed and specified in advance.

Example 1: If the following configurations is proposed,

|  |  |
| --- | --- |
| Downlink DC configuration | Uplink DC configuration |
| EN-DC\_1A-2A-3A-4A\_n5A | DC\_1A\_n5A  DC\_2A\_n5A  DC\_3A\_n5A  DC\_4A\_n5A |

* LTE CA of CA\_1A-2A-3A-4A shall be completed and specified in advance.
* EN-DC of DC\_1A\_n5A, DC\_2A\_n5A, DC\_3A\_n5A and DC\_4A\_n5A shall be completed and specified in advance.

Example 2: If the following configurations is proposed,

|  |  |
| --- | --- |
| Downlink DC configuration | Uplink DC configuration |
| NE-DC\_n5A\_1A-2A-3A-4A | DC\_n5A\_1A  DC\_n5A\_2A  DC\_n5A\_3A  DC\_n5A\_4A |

* LTE CA of CA\_1A-2A-3A-4A shall be completed and specified in advance.
* NE-DC of DC\_n5A\_1A, DC\_n5A\_2A, DC\_n5A\_3A and DC\_n5A\_4A shall be completed and specified in advance.

Example 3: If the following configurations is proposed,

|  |  |
| --- | --- |
| Downlink DC configuration | Uplink DC configuration |
| EN-DC\_1C-2A-3A-4A\_n5C | DC\_1C\_n5C  DC\_2A\_n5C |

* LTE CA of DL\_CA\_1C-2A-3A-4A\_UL\_CA\_1C shall be completed and specified in advance.
* EN-DC of DC\_1C\_n5C and DC\_2A\_n5C shall be completed and specified in advance.

## 4 Objective

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

* Specify the band-combination specific RF requirements for all listed EN-DC configurations consisting of 5 different bands DL with 2 different bands UL (4 different LTE bands and 1 NR band) including at least
  + Applicable frequencies if necessary
  + Applicable bandwidths and bandwidth sets if necessary
* Analyze combinations that have self-desensitization due to following reasons:
  + TX Harmonic and/or intermodulation overlap of receive band
  + TX signal overlap of receiver harmonic frequency
  + TX frequency being in close proximity of one of the receive bands
  + Any other identified reasons such that insufficient cross band isolation, harmonic mixing
* For the combination where self-desensitization exists, specify at least needed
  + ∆TIB, c and ∆RIB, c
  + Reference sensitivity exceptions including MSD test cases
* Add conformance testing in RAN5 specifications (to follow at a later stage)

of all REL-17 EN-DC configurations consisting of 5 different bands DL with 2 different bands UL (4 different LTE bands and 1 NR band) that fall into the category defined by the WI title.

**An overview of these EN-DC and NE-DC configurations is provided in the appended Excel sheet.**

### 4.2 Objective of Performance part WI

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

* Required changes to be added to release independence TS 38.307.

## 5 Expected Output and Time scale

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **New specifications** *{One line per specification. Create/delete lines as needed}* | | | | | |
| Type | TS/TR number | Title | For info  at TSG# | For approval at TSG# | Rapporteur |
| *Internal TR* | *TR 37.717-41-11* | *Rel-17 Dual Connectivity (DC) of 4 bands LTE inter-band CA (4DL/1UL) and 1 NR band (1DL/1UL)* | *RAN#94* | *RAN#95* | *Johannes Hejselbaek, Nokia,* [*johannes.hejselbaek@nokia*](mailto:johannes.hejselbaek@nokia)*.com*  *Core Part* |

|  |  |  |  |
| --- | --- | --- | --- |
| **Impacted existing TS/TR** *{One line per specification. Create/delete lines as needed}* | | | |
| TS/TR No. | Description of change | Target completion plenary# | Remarks |
| *TS 38.101-3* | Add new DC band combinations and related RF core requirements | *TSG#95* | Core part |
| *TS 38.307* | Release independent manner will be applied to all new DC band combinations according to each DC band combination | *TSG#95* | Perf. Part |

## 6 Work item Rapporteur(s)

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## 7 Work item leadership

*RAN WG4*

## 8 Aspects that involve other WGs

*None*

## 9 Supporting Individual Members

|  |
| --- |
| Supporting IM name |
| Nokia |
| Nokia Shanghai Bell |
| LGE |
| Softbank |
| Samsung |
| Ericsson |
| AT&T |
| Huawei |
| Vodafone |
| CHTTL |
| Telstra |
| SK Telecom |
| Rogers |
| ZTE Corporation |
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