**3GPP TSG-RAN WG4 Meeting # 96-e R4-200xxxx**

**Electronic Meeting, 17 August – 28 August, 2020**

**Title: Draft LS on only single switched UL capability**

**Response to:**

**Release: Release 16**

**Work Item: Multi-RAT Dual-Connectivity and Carrier Aggregation enhancements (LTE\_NR\_DC\_CA\_enh)**

**Source: TSG RAN WG4**

**To: TSG RAN WG2**

**Cc:**

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**Attachments:** None

# 1 Overall description

In Rel-16, only single switched UL is supported by some ENDC band combinations, such as DC\_2A\_n2A, DC\_5A\_n5A, DC\_7A\_n7A, DC\_48A\_n48A, DC\_12A\_n71A and so on. It can be foreseen that more and more ENDC band combinations have to be operated with only single switched UL in the future. For intra-band ENDC combinations, RAN4 will continue to discuss and further clarify it in the specifications. Currently, there are three kinds of inter-band ENDC combinations which are listed in table 1 as below with the current situations.

Table 1: Three kinds of inter-band ENDC combinations

|  |  |  |  |
| --- | --- | --- | --- |
| **ENDC combination Type (Three types)** | Mandatory Dual Tx | Single UL allowed due to potential self-interference specified in sub-clause 7.3B.2.3.5 from 38.101-3. (indicate “*singleUL-transmission*” per BC)  1. Easy channel combination (Mandatory Dual Tx)  2. Difficult channel combination (Optional Dual Tx) | Only single switched UL due to potential emission or other issues (Need a capability per BC to support) |
| **RAN4 spec: Inter-band ENDC combinations** | “No” in the last column in sub-clause 5.5B.4.1 from 38.101-3, e.g. DC\_1\_n41 and so on | “specific band combination” in the last column in sub-clause 5.5B.4.1 from 38.101-3 due to self-interference, e.g. DC\_3\_n78, DC\_3\_n41, DC\_1\_n3 and so on. | e.g. DC\_12\_n71 |
| **RAN2 spec: Capability report** | No report | Report “*singleUL-transmission*” | To be defined |
| **Network behaviour** | Dual UL by default | Easy channel combination (Mandatory Dual Tx)  Difficult channel combination (Optional Dual Tx) | Single switched UL based on the reported capability |

However, there is no UE capability to indicate only single switched UL operation. After discussion, RAN4 decide to introduce a capability that UE can report whether to support only single switched UL for inter-band ENDC band combinations. The specific description is shown in Annex.

# 2 Actions

**To TSG RAN WG2**

**ACTION:** RAN4 respectfully requests RAN2 to take the information into account and specify a capability which is shown in Annex for inter-band ENDC combinations.

# 3 Dates of next TSG-RAN WG4 meetings

TSG-RAN4 Meeting#97 26th Oct – 13th Nov 2020 Electronic Meeting

TSG-RAN4 Meeting#98 1st – 5th March 2020 Athens, Greece

# Annex

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Features | Index | Feature group | Components | Prerequisite feature groups | Need for the gNB to know if the feature is supported | Applicable to the capability signalling exchange between UEs (V2X WI only)”. | **Consequence if the feature is not supported by the UE** | **Type**  **(the ‘type’ definition from UE features should be based on the granularity of 1) Per UE or 2) Per Band or 3) Per BC or 4) Per FS or 5) Per FSPC)** | Need of FDD/TDD differentiation | Need of FR1/FR2 differentiation | Capability interpretation for mixture of FDD/TDD and/or FR1/FR2 | Note | Mandatory/Optional |
| 6. LTE\_NR\_DC\_CA\_enh | 6-2 | Only supporting single switched UL | Only supporting single switched UL for specific inter-band ENDC combination | N/A | Yes | N/A | UE can’t support the specific inter-band ENDC combination | Per BC | No | FR1 only | N/A | This capability is only allowed for specific band combinations that are specified in 38.101-3. If this capability isn’t supported for the specific inter-band ENDC combinations, the UE can support simultaneous UL transmissions when the inter-band ENDC combinations is supported. UE can’t simultaneously report this capability and IE “singleUL-Transmission” for the specific inter-band ENDC combinations. IE “tdm-Pattern” will be reused to indicate whether the UE supports the tdm-PatternConfig for this capability associated functionality. The field doesn’t apply to any other fallback band combinations.  For super set combination, the UL configuration can refer to sub-clause 5.5B.4.1 from 38.101-3. | Optional with capability signalling |