**3GPP TSG-RAN WG2 Meeting #113bis-e R2-210xxxx**

**Online, April 12th - April 20th, 2021**

**Title: (draft)** LS on the Intra-band and Inter-band (NG)EN-DC/NE-DC Capabilities

**Release:** Rel-15

**Work Item:** NR\_newRAT-Core

**Source:** ZTE Corporation (To be RAN2)

**To:** RAN4/RAN1

**Cc:**

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**1. Overall Description**

RAN2 discussed the Intra-band and Inter-band (NG)EN-DC/NE-DC capabilities listed below:

| **R1**: 6-24 | Applying the same UL timing between NR and LTE | ***ul-TimingAlignmentEUTRA-NR***Indicates whether to apply the same UL timing between NR and LTE for dynamic power sharing capable UE operating in a synchronous intra-band contiguous (NG)EN-DC. If this field is absent, UE shall be capable of handling a timing difference up to applicable MTTD requirements when operating in a synchronous intra-band contiguous (NG)EN-DC network, as specified in TS 38.133 [5]. If this capability is included in an inter-band (NG)EN-DC BC with an intra-band (NG)EN-DC BC part, this capability is used to indicate the restriction to the intra-band (NG)EN-DC BC part. |
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| **R1**: 6-23 | Incapability motivated by impacts of PA phase discontinuity with overlapping transmissions with non-aligned starting or ending times or hop boundaries across carriers for intra-band EN-DC, intra-band CA, and FDM based ULSUP | ***pa-PhaseDiscontinuityImpacts***Indicates incapability motivated by impacts of PA phase discontinuity with overlapping transmissions with non-aligned starting or ending times or hop boundaries across carriers for intra-band (NG)EN-DC/NE-DC, intra-band CA and FDM based ULSUP. |
| R4: 2-16 | PA architectures for intra-band EN-DC | ***dualPA-Architecture***For an intra-band band combination, this field indicates the support of dual PAs. If absent in an intra-band band combination, the UE supports single PA for all the ULs in the intra-band band combination. For other band combinations, this field is not applicable. |
| R4:2-4 | Simultaneous reception and transmission for inter-band EN-DC (TDD-TDD or TDD-FDD) | ***simultaneousRxTxInterBandENDC***Indicates whether the UE supports simultaneous transmission and reception in TDD-TDD and TDD-FDD inter-band (NG)EN-DC/NE-DC. It is mandatory for certain TDD-FDD and TDD-TDD band combinations defined in TS 38.101-3 [4]. |
| R4:2-6 | Asynchronous FDD-FDD intra-band EN-DC DC | ***asyncIntraBandENDC***Indicates whether the UE supports asynchronous FDD-FDD intra-band (NG)EN-DC with MRTD and MTTD as specified in clause 7.5 and 7.6 of TS 38.133 [5]. If asynchronous FDD-FDD intra-band (NG)EN-DC is not supported, the UE supports only synchronous FDD-FDD intra-band (NG)EN-DC. |

During RAN2 discussion, the below 5 (NG)EN-DC/NE-DC BC types were defined: (the **bolder** part denotes UL)

* Type 1: Intra-band (NG)EN-DC/NE-DC combination without additional inter-band NR and LTE CA component, e.g. DC **41A\_n41A**
* Type 2: Intra-band (NG)EN-DC/NE-DC combination supporting both UL and DL intra-band (NG)EN-DC/NE-DC parts with additional inter-band NR/LTE CA component, e.g. *DC\_25A\_****41A\_n41A***
* Type 3: Intra-band (NG)EN-DC/NE-DC combination without supporting UL in both the bands of the intra-band (NG)EN-DC/NE-DC UL part, e.g. DC\_**25A**\_41A\_**n41A**
* Type 4: Inter-band (NG)EN-DC/NE-DC combination without Intra-band component, in short we call it as Inter-band (NG)EN-DC/NE-DC combination.
* Type 5: Inter-band (NG)EN-DC combination configurations where the frequency range of the E-UTRA band is a subset of the frequency range of the NR band, e.g., DC\_B42\_n77 and DC\_B42\_n78.

RAN2 sincerely requests RAN4/1 to provide answers of following questions for RAN2 future work:

**Question 1: For which (NG)EN-DC/NE-DC BC types the above capabilities (e.g. *ul-TimingAlignmentEUTRA-NR/* *pa-PhaseDiscontinuityImpacts /dualPA-Architecture/ /simultaneousRxTxInterBandENDC /asyncIntraBandENDC )* shall be adopted respectively?**

**Question 2: If the capability *ul-TimingAlignmentEUTRA-NR/* *pa-PhaseDiscontinuityImpacts /ul-dualPA-Architecture/ asyncIntraBandENDC* could be adopted for the (NG)EN-DC/NE-DC BC Type 1/2/3, whether they are used to indicate the restriction to the intra-band (NG)EN-DC/NE-DC BC part?**

**2. Actions:**

**ACTION:** RAN2 sincerely requests RAN4/1 to provide answers of above questions for RAN2 future work.

**3. Date of Next TSG-RAN2 Meetings:**

3GPP RAN2#114-e 19 May – 27 May 2021 Electronic Meeting

3GPP RAN2#115-e 16 August – 27 August 2021 Electronic Meeting