3GPP TSG-RAN WG2 #115 electronic R2-20xxxxx

e-Meeting, Aug16th– 27th 2021

Agenda Item: 5.4.3

Source: ZTE, Sanechips

Title: Summary of offline [AT115-e][017][NR15] UE Capabilties III (ZTE)

Document for: Discussion, Decision

# 1 Introduction

This contribution summarizes the following discussion:

* [AT115-e][017][NR15] UE Capabilties III (ZTE)

Scope: Determine agreeable parts in a first phase, for agreeable parts agree on CRs. Treat R2-2107600, R2-2107601, R2-2106908, R2-2108346, R2-2106956, R2-2108038, R2-2108039, R2-2108718, R2-2108719, R2-2108749, R2-2108751,

Intended outcome: Report, agreed CRs if applicable

Deadline: Schedule 1

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| **Deadline:** Email discussions with Deadline ***Schedule 1***:  A **first round** with **Deadline for comments Thursday Aug 19 1200 UTC** to settle scope what is agreeable etc  A Final round with **Final deadline Thursday Aug 26 1200 UTC.** to settle details / agree CRs etc. |

**Contact form**

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| Company | Email |
| Nokia | amaanat.ali@nokia.com |
| Qualcomm Incorporated | mkitazoe@qti.qualcomm.com |
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# Discussion

## 2.1 Part 1: Intended to determine agreeable parts

Part 1 discussion is focusing on reaching conclusion whether the proposals/CRs can be agreed in principle, and Part 2 discussion would then focus on detailed changes for those agreeable contributions.

### MIMO

[R2-2107600](file:///D:/Documents/3GPP/tsg_ran/WG2/RAN2/2108_R2_115-e/Docs/R2-2107600.zip) Correction to the description of additionalActiveTCI-StatePDCCH Apple CR Rel-15 38.306 15.14.0 0612 - F NR\_newRAT-Core

[R2-2107601](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_115-e\Docs\R2-2107601.zip) Correction to the description of additionalActiveTCI-StatePDCCH Apple CR Rel-16 38.306 16.5.0 0613 - A NR\_newRAT-Core

**Q1: Do companies agree with the intention/modification of the CRs above?**

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| **Company** | **Agree Intention**  **(Yes or No)** | **Agree Modifications**  **(Yes or No)** | **Comments** |
| Nokia | No |  | As we read it, if UE indicates n1, then it must support also this bit in R16. This CR would change that and mean UE only supports single TCI state in total. |
| Qualcomm Incorporated | Yes |  | The current text just says the UE capability parameter is applicable (as opposed to mandatory) when the UE indicates ‘n1’ in maxNumberActiveTCI-PerBWP. |
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### RI bit in EN-DC

[R2-2106908](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_115-e\Docs\R2-2106908.zip) Reply LS on RI bit width for Cat5 UE in EN-DC mode (R1-2106108; contact: Nokia) RAN1 LS in Rel-15 NR\_newRAT-Core To:RAN2

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| RAN1 would like to thank RAN2 of the LS on RI bit width for Cat5 UE in EN-DC mode [[R1-2104161/R2-2104583](https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_105-e/Docs/R1-2104161.zip)].  RAN1 would like to confirm the RAN2 interpretation that:  “*the RI bit width for a Cat5 UE is NOT affected by the number of MIMO layers it supports in EN-DC mode but only by the network configuration parameter maxLayersMIMO-r10, PBCH antenna ports and the UE category (without suffix), as in the legacy LTE*.” |

[R2-2108346](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_115-e\Docs\R2-2108346.zip) Clarification to RI bit width for Cat5 in EN-DC Nokia, Nokia Shanghai Bell discussion Rel-15 NR\_newRAT-Core

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| **Observation 1:** RAN1 LS reply indicates the RAN2 understanding was correct and a Cat5 UE shall use 2-bit RI bit width in EN-DC by default even if it's not capable of 4-layer spatial multiplexing in EN-DC.  **Proposal 1:** Capture a NOTE in the field description of *fourLayerTM3-TM4-r15* in (Rel-16) 36.306 about the RI bit width for Cat5 UEs as per below..  *NOTE 1: Cat5 UE supporting only 2-layer spatial multiplexing for EN-DC will still determine the RI bit width according TS36.212 [22], which means it may still use 2-bit RI bit width despite not supporting more than 2-layer spatial multiplexing.* |

**Q2: Do companies agree to capture the above NOTE 1 in the field description of *fourLayerTM3-TM4-r15* in (Rel-16) 36.306 about the RI bit width for Cat5 UEs?**

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| **Company** | **Yes or No** | **Comments** |
| Nokia | Yes | Proponent, we would like to clarify this to avoid the IODT issue. |
| Qualcomm Incorporated | Yes |  |
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### Intra-band and Inter-band UE capability

[R2-2106956](file:///D:/Documents/3GPP/tsg_ran/WG2/RAN2/2108_R2_115-e/Docs/R2-2106956.zip) Reply LS on the Intra-band and Inter-band (NG)EN-DC/NE-DC Capabilities (R4-2107907; contact: ZTE) RAN4 LS in Rel-15 NR\_newRAT-Core To:RAN2 Cc:RAN1

Moved from 5.1

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| **Question 1**: For which (NG)EN-DC/NE-DC BC types the above capabilities *(ul-TimingAlignmentEUTRA-NR/ pa-PhaseDiscontinuityImpacts /dualPA-Architecture/ /simultaneousRxTxInterBandENDC /asyncIntraBandENDC )* are applicable?  **Answer**: From RAN4 perspective,   * *dualPA-Architecture* is applicable to (NG)EN-DC/NE-DC BC Type 1, Type 2 and Type 5, * *simultaneousRxTxInterBandENDC* is applicable to (NG)EN-DC/NE-DC BC Type 2, Type 3 and Type 4, * *asyncIntraBandENDC* is applicable to (NG)EN-DC/NE-DC BC Type 1, Type 2, Type 3 and Type 5.   **Question 2**: If the capability *ul-TimingAlignmentEUTRA-NR/ pa-PhaseDiscontinuityImpacts /dualPA-Architecture/ asyncIntraBandENDC* are applicable to 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?  **Answer:** Yes, *dualPA-Architecture/ asyncIntraBandENDC* are used to indicate the restriction to the intra-band (NG)EN-DC/NE-DC BC part. |

[R2-2108038](file:///D:/Documents/3GPP/tsg_ran/WG2/RAN2/2108_R2_115-e/Docs/R2-2108038.zip) CR on the Intra-band and Inter-band EN-DC Capabilities - R15 ZTE Corporation, Sanechips CR Rel-15 38.306 15.14.0 0517 3 F NR\_newRAT-Core R2-2105182

[R2-2108039](file:///D:/Documents/3GPP/tsg_ran/WG2/RAN2/2108_R2_115-e/Docs/R2-2108039.zip) CR on the Intra-band and Inter-band EN-DC Capabilities - R16 ZTE Corporation, Sanechips CR Rel-16 38.306 16.5.0 0518 3 A NR\_newRAT-Core R2-2105183

About this topic, in the previous meeting, RAN2 sent an LS (R2-2104550) to RAN1/4 to ask 2 questions as below:

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| Question 1: For which (NG)EN-DC/NE-DC BC types the above capabilities (*ul-TimingAlignmentEUTRA-NR/* *pa-PhaseDiscontinuityImpacts /dualPA-Architecture/ /simultaneousRxTxInterBandENDC /asyncIntraBandENDC )* are applicable?  Question 2: If the capability *ul-TimingAlignmentEUTRA-NR/* *pa-PhaseDiscontinuityImpacts /ul-dualPA-Architecture/ asyncIntraBandENDC* are applicable to 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? |

RAN4 has sent the reply LS as above, however, we haven’t got the reply LS from RAN1 even RAN1 has made the below agreement in the last meeting.

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| Agreement:  Regarding questions mentioned in RAN2 LS R1-2104162/R2-2104550,   * UE feature 6-24 (ul-TimingAlignmentEUTRA-NR) is applicable to Type 1 and Type 2 (NG)EN-DC BC types. * UE feature 6-23 (pa-PhaseDiscontinuityImpacts) is applicable to Type 1 and Type 2 (NG)EN-DC/NE-DC BC types. * Both 6-24 (ul-TimingAlignmentEUTRA-NR) and 6-23 (pa-PhaseDiscontinuityImpacts) are used to indicate the restriction to the intra-band (NG)EN-DC/NE-DC BC part. * RAN1 further discusses whether 6-24 (ul-TimingAlignmentEUTRA-NR) and 6-23 (pa-PhaseDiscontinuityImpacts) can be applicable to Type 5 (NG)EN-DC/NE-DC BC type by taking RAN4 discussion outcome into account. |

To accelerate the discussion, we’d like to collect the companies views on the modifications to the RAN4 related features first, including *dualPA-Architecture/ /simultaneousRxTxInterBandENDC /asyncIntraBandENDC.* For the RAN1 feature *(ul-TimingAlignmentEUTRA-NR/pa-PhaseDiscontinuityImpacts*), we can wait for the RAN1’s reply LS.

**Q3: Do companies agree that the modifications to the *dualPA-Architecture/ /simultaneousRxTxInterBandENDC /asyncIntraBandENDC* in the** [**R2-2108038**](file:///D:/Documents/3GPP/tsg_ran/WG2/RAN2/2108_R2_115-e/Docs/R2-2108038.zip)**/**[**R2-2108039**](file:///D:/Documents/3GPP/tsg_ran/WG2/RAN2/2108_R2_115-e/Docs/R2-2108038.zip) **are aligned with RAN4’s Reply LS** [**R2-2106956**](file:///D:/Documents/3GPP/tsg_ran/WG2/RAN2/2108_R2_115-e/Docs/R2-2106956.zip)**?**

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| **Company** | **Yes or No** | **Comments** |
| Nokia | Yes | We did not check this in detail but the changes seem aligned to the response in the LS. |
| Qualcomm Incorporated | Yes, but | We are still waiting for RAN1 input for ul-TimingAlignmentEUTRA-NR and pa-PhaseDiscontinuityImpacts, but we have the same understanding as proposed in the CRs. |
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### IMS Capability

[R2-2108718](file:///D:/Documents/3GPP/tsg_ran/WG2/RAN2/2108_R2_115-e/Docs/R2-2108718.zip) Clarification on IMS video over split bearer in (NG)EN-DC Google Inc. CR Rel-15 36.306 15.10.0 1811 1 F NR\_newRAT-Core R2-2105188

[R2-2108719](file:///D:/Documents/3GPP/tsg_ran/WG2/RAN2/2108_R2_115-e/Docs/R2-2108719.zip) Clarification on IMS video over split bearer in (NG)EN-DC Google Inc. CR Rel-16 36.306 16.5.0 1812 1 A NR\_newRAT-Core R2-2105189

**Q4: Do companies agree with the intention/modification of the CRs above?**

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| **Company** | **Agree Intention**  **(Yes or No)** | **Agree Modifications**  **(Yes or No)** | **Comments** |
| Nokia | No |  | The discussion is not in RAN2. |
| Qualcomm Incorporated | Yes |  | Makes sense to apply the same handling as IMS voice. |
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[R2-2108749](file:///D:/Documents/3GPP/tsg_ran/WG2/RAN2/2108_R2_115-e/Docs/R2-2108749.zip) Clarification on IMS video over split bearer in NR-DC and NE-DC Google Inc. CR Rel-15 38.306 15.14.0 0581 1 F NR\_newRAT-Core R2-2105190

[R2-2108751](file:///D:/Documents/3GPP/tsg_ran/WG2/RAN2/2108_R2_115-e/Docs/R2-2108751.zip) Clarification on IMS video over split bearer in NR-DC and NE-DC Google Inc. CR Rel-16 38.306 16.5.0 0582 1 A NR\_newRAT-Core R2-2105191

**Q5: Do companies agree with the intention/modification of the CRs above?**

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| **Company** | **Agree Intention**  **(Yes or No)** | **Agree Modifications**  **(Yes or No)** | **Comments** |
| Nokia | No |  | The discussion is not in RAN2. |
| Qualcomm Incorporated | Yes |  | Makes sense to apply the same handling as IMS voice. |
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## 2.2 Part 2: Intended to progress discussion on agreeable parts

- To be updated after discussion on part 1 -

# 3 Conclusion

# 4 References

1. [R2-2107600](file:///D:/Documents/3GPP/tsg_ran/WG2/RAN2/2108_R2_115-e/Docs/R2-2107600.zip) Correction to the description of additionalActiveTCI-StatePDCCH Apple CR Rel-15 38.306 15.14.0 0612 - F NR\_newRAT-Core
2. [R2-2107601](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_115-e\Docs\R2-2107601.zip) Correction to the description of additionalActiveTCI-StatePDCCH Apple CR Rel-16 38.306 16.5.0 0613 - A NR\_newRAT-Core
3. [R2-2106908](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_115-e\Docs\R2-2106908.zip) Reply LS on RI bit width for Cat5 UE in EN-DC mode (R1-2106108; contact: Nokia) RAN1 LS in Rel-15 NR\_newRAT-Core To:RAN2
4. [R2-2108346](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_115-e\Docs\R2-2108346.zip) Clarification to RI bit width for Cat5 in EN-DC Nokia, Nokia Shanghai Bell discussion Rel-15 NR\_newRAT-Core
5. [R2-2106956](file:///D:/Documents/3GPP/tsg_ran/WG2/RAN2/2108_R2_115-e/Docs/R2-2106956.zip) Reply LS on the Intra-band and Inter-band (NG)EN-DC/NE-DC Capabilities (R4-2107907; contact: ZTE) RAN4 LS in Rel-15 NR\_newRAT-Core To:RAN2 Cc:RAN1
6. [R2-2108038](file:///D:/Documents/3GPP/tsg_ran/WG2/RAN2/2108_R2_115-e/Docs/R2-2108038.zip) CR on the Intra-band and Inter-band EN-DC Capabilities - R15 ZTE Corporation, Sanechips CR Rel-15 38.306 15.14.0 0517 3 F NR\_newRAT-Core R2-2105182
7. [R2-2108039](file:///D:/Documents/3GPP/tsg_ran/WG2/RAN2/2108_R2_115-e/Docs/R2-2108039.zip) CR on the Intra-band and Inter-band EN-DC Capabilities - R16 ZTE Corporation, Sanechips CR Rel-16 38.306 16.5.0 0518 3 A NR\_newRAT-Core R2-2105183
8. [R2-2108718](file:///D:/Documents/3GPP/tsg_ran/WG2/RAN2/2108_R2_115-e/Docs/R2-2108718.zip) Clarification on IMS video over split bearer in (NG)EN-DC Google Inc. CR Rel-15 36.306 15.10.0 1811 1 F NR\_newRAT-Core R2-2105188
9. [R2-2108719](file:///D:/Documents/3GPP/tsg_ran/WG2/RAN2/2108_R2_115-e/Docs/R2-2108719.zip) Clarification on IMS video over split bearer in (NG)EN-DC Google Inc. CR Rel-16 36.306 16.5.0 1812 1 A NR\_newRAT-Core R2-2105189
10. [R2-2108749](file:///D:/Documents/3GPP/tsg_ran/WG2/RAN2/2108_R2_115-e/Docs/R2-2108749.zip) Clarification on IMS video over split bearer in NR-DC and NE-DC Google Inc. CR Rel-15 38.306 15.14.0 0581 1 F NR\_newRAT-Core R2-2105190
11. [R2-2108751](file:///D:/Documents/3GPP/tsg_ran/WG2/RAN2/2108_R2_115-e/Docs/R2-2108751.zip) Clarification on IMS video over split bearer in NR-DC and NE-DC Google Inc. CR Rel-16 38.306 16.5.0 0582 1 A NR\_newRAT-Core R2-2105191
12. [R2-210](file:///D:/Documents/3GPP/tsg_ran/WG2/RAN2/2108_R2_115-e/Docs/R2-2108751.zip)4550 LS on the Intra-band and Inter-band (NG)EN-DC/NE-DC Capabilities To: RAN4/RAN1 Rel15 NR\_newRAT-Core