**3GPP TSG RAN WG1 #102-e R1-20xxxxx**

**e-Meeting, August 17th – 28th, 2020**

**Agenda Item:** **7.2.3**

**Source: Moderator (AT&T)**

**Title: Feature Lead Summary of 7.2.3 Maintenance of Integrated Access and Backhaul for NR**

**Document for:** **Discussion/Approval**

# Introduction

This contribution provides a summary of 7.2.3 Maintenance of Integrated Access and Backhaul for NR.

# Remaining Rel-16 Maintenance Issues

## Starting slot within DCI 2\_5 indication

**Source**: R1-2005316

**Background:** The current TS 38.213 states the following:

*An AI index field value in a DCI format 2\_5 indicates to an IAB-node DU a soft symbol availability in each slot for a number of slots starting from a slot where the IAB-node detects the DCI format 2\_5.*

The specification text “from **a** slot” does not specifically mention whether the slot is defined based on the DU or MT resource configuration/timing and configured SCS for the AI index file value in DCI Format 2\_5. If the SCS is different for the IAB-DU and IAB-MT, different slots may be identified for that reference slot.

**FL Conclusion 2.1.1:** Discuss whether this is a critical issue and potential solution in RAN1#102-e.

**Discussion:**

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| **Company** | **Do you agree with FL Conclusion 2.1.1?** | **Comments** |
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## Indication of soft resource availability in case of paired spectrum

**Source**: R1-2005316

**Background:** For paired spectrum, RAN1#100b-e reached the following agreement [1]:

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| Agreements For paired spectrum, the DU resource configuration framework is extended with the following:  Two separate per-cell D/U/F and H/S/NA configurations are provided for DL and UL respectively.  Whether this signalling is supported in Rel-16 is up to RAN3 and no additional specification impact is considered in RAN1 in Rel-16 for IAB operation in paired spectrum. |

RAN3[2] has accordingly provided the signaling related to D/U/F and H/S/NA configurations for DL and UL respectively in paired spectrum. The signaling are called “**gNB-DU Cell Resource Configuration-FDD-DL**” and “**gNB-DU Cell Resource Configuration-FDD-UL**”. Meanwhile, RAN3 also updated the signaling for unpaired spectrum to “**gNB-DU Cell Resource Configuration-TDD**”.

**FL Conclusion 2.2.1:** This issue can be addressed in a straightforward manner as the following suggested editorial updates to TS 38.213:

* *To rename the parameter “IAB-DU-Resource-Configuration-TDD-Config” in 38.213 to “gNB-DU Cell Resource Configuration-TDD”.*
* *To add following description in 38.213 for paired spectrum operation:*

*The IAB-DU can assume a same SCS configuration for availabilityCombinations for IAB-DU downlink of a serving cell as an SCS configuration provided by gNB-DU Cell Resource Configuration-FDD-DL for the serving cell, and a same SCS configuration for availabilityCombinations for IAB-DU uplink of a serving cell as an SCS configuration provided by gNB-DU Cell Resource Configuration-FDD-UL for the serving cell.*

**Discussion:**

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| **Company** | **Do you agree with FL Conclusion 2.2.1?** | **Comments** |
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## Indication of soft resource availability in case of paired spectrum

**Source**: R1-2005316

**Background:** The current TS 38.213 also does not show how to determine the availability of soft resources for paired spectrum by DCI format 2\_5. DCI format 2\_5 structure is similar as DCI format 2\_0 for a UE in Section 11 of TS 38.213 except that soft resources availability for an IAB-DU can be indicated by DCI format 2\_5 and slot formats for a UE can be indicated by DCI format 2\_0. Consequently, there can be two alternatives:

* Alt1: to apply a similar way as in slot format determination with DCI format 2\_0 to paired spectrum, i.e., for each  values provided by *resource*Availability, the first  values for the soft symbol availability combination is applicable to DL carrier and the next  values are applicable to the UL carrier.
* Alt2: to add a parameter *resource*Availability\_UL in TS38.213 for indicating resource availability for uplink of an IAB-DU serving cell and to reuse the resource availability indication signaling of unpaired spectrum for downlink of paired spectrum.

**FL Conclusion 2.3.1:** Given the agreement in RAN1#100b-e, it is not possible to consider either Alt. 1 or Alt. 2 as a maintenance item in Rel-16:

Agreements For paired spectrum, the DU resource configuration framework is extended with the following:

Two separate per-cell D/U/F and H/S/NA configurations are provided for DL and UL respectively.

Whether this signalling is supported in Rel-16 is up to RAN3 and no additional specification impact is considered in RAN1 in Rel-16 for IAB operation in paired spectrum.

**Discussion:**

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| **Company** | **Do you agree with FL Conclusion 2.3.1?** | **Comments** |
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## PDCCH monitoring in IAB

**Source**: R1-2006377

**Background:** To indicate resource availability information for DU soft resource, DCI format 2\_5 is introduced in Rel-16 IAB. An IAB-MT monitors PDCCH with DCI format 2\_5 in CSS and/or USS, where CRC for DCI format 2\_5 is scrambled by AI-RNTI.

However, in the current specification on TS 38.213, search space sets for monitoring DCI format with CRC scrambled by an AI-RNTI is not specified. As provided in Proposal 1, it should be added that for a DCI format with CRC scrambled by an AI-RNTI, an IAB-MT monitors PDCCH candidates in a Type3-PDCCH CSS set and a USS set.

**FL Conclusion 2.4.1:** This issue can be addressed in a straightforward manner as a suggested editorial update to TS 38.213:

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10.1   UE procedure for determining physical downlink control channel assignment

A set of PDCCH candidates for a UE to monitor is defined in terms of PDCCH search space sets. A search space set can be a CSS set or a USS set. A UE monitors PDCCH candidates in one or more of the following search spaces sets

-     a Type0-PDCCH CSS set configured by *pdcch-ConfigSIB1* in *MIB* or by *searchSpaceSIB1* in *PDCCH-ConfigCommon* or by *searchSpaceZero* in *PDCCH-ConfigCommon* for a DCI format with CRC scrambled by a SI-RNTI on the primary cell of the MCG

-     a Type0A-PDCCH CSS set configured by *searchSpaceOtherSystemInformation* in *PDCCH-ConfigCommon* for a DCI format with CRC scrambled by a SI-RNTI on the primary cell of the MCG

-     a Type1-PDCCH CSS set configured by *ra-SearchSpace* in *PDCCH-ConfigCommon* for a DCI format with CRC scrambled by a RA-RNTI, a MsgB-RNTI, or a TC-RNTI on the primary cell

-     a Type2-PDCCH CSS set configured by *pagingSearchSpace* in *PDCCH-ConfigCommon* for a DCI format with CRC scrambled by a P-RNTI on the primary cell of the MCG

-     a Type3-PDCCH CSS set configured by *SearchSpace* in *PDCCH-Config* with *searchSpaceType* = *common* for DCI formats with CRC scrambled by INT-RNTI, SFI-RNTI, TPC-PUSCH-RNTI, TPC-PUCCH-RNTI, TPC-SRS-RNTI, CI-RNTI, PS-RNTI, or AI-RNTI and, only for the primary cell, C-RNTI, MCS-C-RNTI, or CS-RNTI(s), and

-     a USS set configured by *SearchSpace* in *PDCCH-Config* with *searchSpaceType* = *ue-Specific* for DCI formats with CRC scrambled by C-RNTI, MCS-C-RNTI, SP-CSI-RNTI, CS-RNTI(s), SL-RNTI, SL-CS-RNTI, SL-L-CS-RNTI, or AI-RNTI.

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**Discussion:**

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| **Company** | **Do you agree with FL Conclusion 2.4.1?** | **Comments** |
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# Summary

TBD