3GPP TSG-RAN WG2 #116bis-e draftTdoc R2-2201738

Electronic meeting, Jan 17th – 25th January 2022

Agenda Item: 8.12.2.2

Source: Ericsson (Rapporteur)

Title: NCD-SSB and Initial BWP aspects

Document for: Discussion, Decision

# 1 Introduction

RAN1 sent an LS to RAN2 and RAN4 on use of NCD-SSB instead of CD-SSB in [R1-2112802](https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_107-e/Docs/R1-2112802.zip) and asked for feedback from RAN2 and RAN4 on whether the working assumptions are acceptable from RAN2 and RAN4 perspectives, respectively.

In RAN2#116bis-e, a report is prepared to summarize the Tdocs listed below:

* [R2-2200190](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_116bis-e/Docs/R2-2200190.zip) Discussions on RedCap-specific BWPs Qualcomm Incorporated
* [R2-2200287](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_116bis-e/Docs/R2-2200287.zip) Open issues on Early identification, camping restrictions and NCD-SSB Intel Corporation
* [R2-2200401](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_116bis-e/Docs/R2-2200401.zip) BWP configuration for RedCap UE DENSO CORPORATION
* [R2-2200554](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_116bis-e/Docs/R2-2200554.zip) Identification and access restriction of RedCap UE, and NCD-SSB related issuesHuawei, HiSilicon
* [R2-2200597](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_116bis-e/Docs/R2-2200597.zip) Issues on NCD SSB, identification and access for RedCap vivo, Guangdong Genius
* [R2-2200608](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_116bis-e/Docs/R2-2200608.zip) Discussion on separate initial BWP and NCD-SSB for RedCap UE ZTE Corporation, Sanechips
* [R2-2200830](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_116bis-e/Docs/R2-2200830.zip) Using NCD-SSB or CSI-RS in DL BWPs for RedCap UEs Ericsson
* [R2-2200831](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_116bis-e/Docs/R2-2200831.zip) [DRAFT] Reply LS on the use of NCD-SSB or CSI-RS in DL BWPs for RedCap UEs Ericsson
* [R2-2200862](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_116bis-e/Docs/R2-2200862.zip) Discussion on use of NCD-SSB or CSI-RS in DL BWPs for RedCap UE CMCC
* [R2-2201113](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_116bis-e/Docs/R2-2201113.zip) RedCap UE power-saving aspects at cell re-selection Apple
* [R2-2201461](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_116bis-e/Docs/R2-2201461.zip) Aspects related to use of NCD-SSB MediaTek Inc.

The summary was provided in [R2-2201732](http://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_116bis-e/Docs/R2-2201732.zip) and during the online discussion, the following agreements were made:

Agreements:

1. A RedCap UE in idle/inactive mode monitors paging only in an initial BWP (default or RedCap specific) associated with CD-SSB and performs cell (re-)selection and measurements on the CD-SSB

2. If a RedCap-specific initial UL BWP is configured for RACH, RedCap UEs shall use only the RedCap-specific initial UL BWP to perform RACH.

In this document, we continue the discussion based on the agreements above and the list of Tdocs provided above with the intention to formulate a list of proposals that are agreeable and a list of proposals that require further discussion during the related online session.

# 2 Discussion

## 2.1 RRC Idle/Inactive mode

**Q 2.1.1** If a RedCap UE in idle/inactive mode is configured with a separate initial BWP associated with no SSB (CD or NCD) for RACH, do you think that measurements should be based on CD-SSB for RACH resource selection? Please elaborate your reply. If you agree comment on whether field description of *rach-ConfigCommon* should be updated accordingly.

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

**Summary – Q 2.1.1**

TBD

1. …

**Q 2.1.2** If a RedCap UE in idle/inactive mode is configured with a separate initial BWP associated with no SSB (CD or NCD) for RACH, do you think that *PDCCH-ConfigCommon* of the separate initial DL BWP should include common search space configuration for RAR but not for paging, SIB1 and other SIBs? Please elaborate your reply.

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

**Summary – Q 2.1.2**

TBD

**Q 2.1.3** If a RedCap UE in idle/inactive mode is configured with a separate initial BWP associated with no SSB (CD or NCD) for RACH, do you think

* (**Option 1**) it should be up to UE implementation to perform new RSRP measurement in a DL BWP associated with CD-SSB before a Msg1/A retransmission, or
* (**Option 2**) UE should always perform new RSRP measurement in a DL BWP associated with CD-SSB?

Please elaborate your reply.

|  |  |  |
| --- | --- | --- |
| **Company** | **Option (1/2/Other)** | **Comments** |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

**Summary – Q 2.1.3**

TBD

**Q 2.1.4** Do you think RedCap-specific two-step RACH (if configured) and four-step RACH should always configured in the same BWP? Please elaborate your reply.

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

**Summary – Q 2.1.4**

TBD

**Q 2.1.5** Please provide your comments here if you think there are any other issues that should be discussed for RedCap UEs in idle/inactive mode.

|  |  |
| --- | --- |
| **Company** | **Comments** |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

**Summary – Q 2.1.5**

TBD

## 2.2 RRC Connected mode

**Q 2.2.1** In RRC connected mode, do you think it should be possible to configure NCD-SSB for a RedCap UE in dedicated DL BWP? Please elaborate your reply.

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

**Summary – Q 2.2.1**

TBD

**Q 2.2.2** For connected mode operation do you think NCD-SSB should have the same properties (e.g., *ssb-PositionsInBurst*, *PCI*, *ssb-periodicity*, *ssb-PBCH-BlockPower*) as the corresponding CD-SSB? Please elaborate your reply. Note that the question is about “properties”, not “configuration” (please see the next question regarding the discussion on configuration).

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

**Summary – Q 2.2.2**

TBD

**Q 2.2.3** For connected mode operation do you think it should be possible for the network to provide *absoluteFrequencySSB*, *ssb-PositionsInBurst*, and *ssb-periodicity* explicitly for NCD-SSB, i.e., other properties such as *PCI*, *ssb-PBCH-BlockPower* are configured with the same values from serving cell's CD-SSB? Please elaborate your reply.

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

**Summary – Q 2.2.3**

TBD

**Q 2.2.4** For connected mode operation do you think periodicity of NCD-SSB shall be not less than the periodicity of serving cell’s CD-SSB? Please elaborate your reply.

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

**Summary – Q 2.2.4**

TBD

**Q 2.2.5** For connected mode operation if NCD-SSB is configured in a dedicated DL BWP, do you think RedCap UE should assume that the “*SSB*” in *QCL-Info* IE and “*ssb-Index*” in *RadioLinkMonitoringRS* IE refer to the beam with the same index in the NCD-SSB configured in that BWP? Please elaborate your reply.

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

**Summary – Q 2.2.5**

TBD

**Q 2.2.6** For connected mode operation if NCD-SSB is configured in a dedicated DL BWP whose paired UL BWP is configured with *RACH-ConfigDedicated*, *RACH-ConfigCommon* or *BeamFailureRecovery Config*, do you think the SSB in that RACH configuration (e.g., in *CFRA-SSB-Resource* IE or in *PRACH-ResourceDedicatedBFR* IE) should refer to the NCD-SSB configured in that DL BWP? Please elaborate your reply.

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

**Summary – Q 2.2.6**

TBD

**Q 2.2.7** For connected mode operation do you think neighbour cell measurements based on NCD-SSB should be supported for RedCap UEs? Please elaborate your reply.

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

**Summary – Q 2.2.7**

TBD

**Q 2.2.8** For serving cell measurement based on NCD-SSB in connected mode; do you think

* (**Option 1**) *MeasObjectId* should be configured for each NCD-SSB, or
* (**Option 2**) *MeasObjectNR* is extended to include *ssbFrequency* for each NCD-SSB?

Please elaborate your reply.

|  |  |  |
| --- | --- | --- |
| **Company** | **Option**  | **Comments** |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

**Summary – Q 2.2.8**

TBD

**Q 2.2.9** Do you think RAN1 working assumption regarding the use of CSI-RS in connected mode is acceptable from RAN2 standpoint? Please elaborate your reply.

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

**Summary – Q 2.2.9**

TBD

**Q 2.2.10** Do you think a RedCap UE, which does not support CSI-RS, should be able to report “Not need NCD-SSB” as an optional UE capability? Please elaborate your reply.

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

**Summary – Q 2.2.10**

TBD

**Q 2.2.11** Do you think it should be possible to use NCD-SSB to trigger the handover procedure, i.e., whether SSB indicated in *absoluteFrequencySSB* of *frequencyInfo-DL* IE in handover command must be CD-SSB? Please elaborate your reply.

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

**Summary – Q 2.2.11**

TBD

**Q 2.2.12** Do you think a non-RedCap UE should be able to use NCD-SSB instead of CD-SSB with an optional capability? Please elaborate your reply.

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

**Summary – Q 2.2.12**

TBD

**Q 2.2.13** Please provide your comments here if you think there are any other issues that should be discussed for RedCap UEs in connected mode.

|  |  |
| --- | --- |
| **Company** | **Comments** |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

**Summary – Q 2.2.13**

TBD

# 3 Conclusion

Based on the discussion above rapporteur suggests a discussion on the following proposals:

[Proposal 1 …](#_Toc93433069)

# References

1. [R2-2200190](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_116bis-e/Docs/R2-2200190.zip) Discussions on RedCap-specific BWPs Qualcomm Incorporated
2. [R2-2200287](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_116bis-e/Docs/R2-2200287.zip) Open issues on Early identification, camping restrictions and NCD-SSB Intel Corporation
3. [R2-2200401](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_116bis-e/Docs/R2-2200401.zip) BWP configuration for RedCap UE DENSO CORPORATION
4. [R2-2200554](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_116bis-e/Docs/R2-2200554.zip) Identification and access restriction of RedCap UE, and NCD-SSB related issues Huawei, HiSilicon
5. [R2-2200597](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_116bis-e/Docs/R2-2200597.zip) Remaining issues on NCD SSB, identification and access for RedCap vivo, Guangdong Genius
6. [R2-2200608](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_116bis-e/Docs/R2-2200608.zip) Discussion on separate initial BWP and NCD-SSB for RedCap UE ZTE Corporation, Sanechips
7. [R2-2200830](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_116bis-e/Docs/R2-2200830.zip) Using NCD-SSB or CSI-RS in DL BWPs for RedCap UEs Ericsson
8. [R2-2200831](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_116bis-e/Docs/R2-2200831.zip) [DRAFT] Reply LS on the use of NCD-SSB or CSI-RS in DL BWPs for RedCap UEs Ericsson
9. [R2-2200862](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_116bis-e/Docs/R2-2200862.zip) Discussion on use of NCD-SSB or CSI-RS in DL BWPs for RedCap UE CMCC
10. [R2-2201113](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_116bis-e/Docs/R2-2201113.zip) RedCap UE power-saving aspects at cell re-selection Apple
11. [R2-2201461](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_116bis-e/Docs/R2-2201461.zip) Aspects related to use of NCD-SSB MediaTek Inc.