**3GPP TSG RAN WG1 #107-e Draft R1-2112802**

**e-Meeting, 11th – 19th November, 2021**

**Title:** LS on use of NCD-SSB or CSI-RS in DL BWPs for RedCap UE

**Response to:**

**Release:** Rel-17

**Work Item:** Support of reduced capability NR devices (NR\_redcap)

**Source:** RAN1

**To:** RAN2, RAN4

**Cc:**

**Contact person:** Johan Bergman, johan (dot) bergman (at) ericsson (dot) com

**Send any reply LS to:** 3GPP Liaisons Coordinator, mailto:3GPPLiaison@etsi.org

**Attachments:** None

# 1 Overall description

RAN1#107-e has made the following agreements and working assumptions related to DL BWP operation for RedCap UEs (where the differences between the agreements for FR1 and FR2 are indicated in blue colour).

|  |
| --- |
| Agreement:* For both FR1 and FR2, for a cell that allows a RedCap UE to access, network can configure a separate initial DL BWP for RedCap UEs in SIB. At least the case when the separate initial DL BWP includes CD-SSB and the entire CORESET#0 is supported
	+ It can be used in idle/inactive mode (including paging) and during and after initial access, when applicable
	+ It is no wider than the maximum RedCap UE bandwidth.
	+ This applies to both TDD and FDD (including FD FDD and HD FDD) cases.

Agreement:* For FR1,
	+ For a separate initial DL BWP (if it does not include CD-SSB and the entire CORESET#0) from RAN1 perspective,
		- If it is configured for random access while not for paging in idle/inactive mode, RedCap UE does NOT expect it to contain SSB/CORESET#0/SIB.
		- Note: RAN1 assumes REDCAP UE performing Random access in the separate DL BWP does not need to monitor paging in a BWP containing CORESET#0
		- Working assumption: If it is configured for paging, RedCap UE expects it to contain NCD-SSB for serving cell but not CORESET#0/SIB from RAN1 perspective
	+ For an RRC-configured active DL BWP in connected mode (if it does not include CD-SSB and the entire CORESET#0) from RAN1 perspective,
		- A RedCap UE supporting mandatory FG 6-1 (but not optional FG 6-1a) expects it to contain NCD-SSB for serving cell but not CORESET#0/SIB
		- A RedCap UE can indicate the following as optional capability:
			* Not need NCD-SSB: A RedCap UE can in addition optionally support relevant operation based on CSI-RS (working assumption) and/or FG 6-1a by reporting optional capabilities.
	+ Note: if a separate initial/RRC configured DL BWP is configured to contain the entire CORESET#0, CD-SSB is expected by RedCap UE.
	+ Note: The network may choose to configure SSB or MIB-configured CORESET#0 or SIB1 to be within the respective DL BWP.
	+ Note: If a separate SIB-configured initial DL BWP for RedCap UEs contains the entire CORESET#0, the RedCap UE shall use the bandwidth and location of the CORESET#0 in DL during initial access.
	+ Note: NCD-SSB periodicity is not required to be configured the same as that of CD-SSB
	+ Note: Periodicity of NCD-SSB shall be not less than periodicity of CD-SSB

Agreement:* For FR2,
	+ For a separate initial DL BWP (if it does not include CD-SSB ~~and the entire CORESET#0~~) from RAN1 perspective,
		- If it is configured for random access while not for paging in idle/inactive mode, RedCap UE does NOT expect it to contain SSB/CORESET#0/SIB.
		- Note: RAN1 assumes REDCAP UE performing Random access in the separate DL BWP does not need to monitor paging in a BWP containing CORESET#0
		- Working assumption: If it is configured for paging, RedCap UE expects it to contain NCD-SSB for serving cell but not CORESET#0/SIB from RAN1 perspective
	+ For an RRC-configured active DL BWP in connected mode (if it does not include CD-SSB ~~and the entire CORESET#0~~) from RAN1 perspective,
		- A RedCap UE supporting mandatory FG 6-1 (but not optional FG 6-1a) expects it to contain NCD-SSB for serving cell but not CORESET#0/SIB
		- A RedCap UE can indicate the following as optional capability:
			* Not need NCD-SSB: A RedCap UE can in addition optionally support relevant operation based on CSI-RS (working assumption) and/or FG 6-1a by reporting optional capabilities.
	+ Note: For SSB and CORESET#0 multiplexing pattern 1, if a separate initial/RRC configured DL BWP is configured to contain the entire CORESET#0, CD-SSB is expected by RedCap UE.
	+ Note: The network may choose to configure SSB or MIB-configured CORESET#0 or SIB1 to be within the respective DL BWP.
	+ Note: If a separate SIB-configured initial DL BWP for RedCap UEs contains the entire CORESET#0, the RedCap UE shall use the bandwidth and location of the CORESET#0 in DL during initial access.
	+ Note: NCD-SSB periodicity is not required to be configured the same as that of CD-SSB
	+ Note: Periodicity of NCD-SSB shall be not less than periodicity of CD-SSB
 |

RAN1 respectfully requests RAN2 and RAN4 to provide feedback on whether the above highlighted working assumptions are acceptable from RAN2 and RAN4 perspectives, respectively.

# 2 Actions

**To RAN2 and RAN4:**

**ACTION:** RAN1 respectfully requests RAN2 and RAN4 to provide feedback on whether the above highlighted working assumptions are acceptable from RAN2 and RAN4 perspectives, respectively.

# 3 Dates of next TSG-RAN WG1 meetings

TSG-RAN WG1 Meeting #107bis-e 17th – 25th January 2022 Online

TSG-RAN WG1 Meeting #108-e 21st February – 3rd March 2022 Online