**3GPP TSG RAN WG1 #107-e R1-21xxxxx**

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

**Title:** [Draft] LS on use of NCD-SSB in initial DL BWP used for paging for RedCap UE

**Response to:**

**Release:** Rel-17

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

**Source:** Ericsson [To be 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 operation with a separate initial DL BWP for RedCap UEs (where the differences between the agreements for FR1 and FR2 are indicated in blue colour).

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| 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
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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