**3GPP TSG RAN WG1 Meeting #116bis R1-24xxxxx**

**Chicago, USA, 13th – 17th November 2023**

**Title:** [Draft] Reply LS on 2-step RACH for eRedCap

**Response to:** [R1-2401948](https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_116b/Docs/R1-2401948.zip) / [R2-2401890](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_125/Docs/R2-2401890.zip)

**Release:** Rel-18

**Work Item:** Enhanced support of reduced capability NR devices (NR\_redcap\_enh-Core)

**Source:** Ericsson [To be RAN1]

**To:** RAN2

**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#116bis discussed the following aspects of 2-step RACH for eRedCap raised in the LS from RAN2:

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| RAN2 had a discussion on how to configure 2-step RA resources for eRedCap UEs. RAN2 decided to recommend RAN1 to support 2-step RA for eRedCap UEs on 2-step eRedCap resources. If this is not agreeable RAN2 will assume that 2-step RA for eRedCap is not supported at all.It was also agreed that the following is not specified from RAN2 standpoint: the case where an eRedCap UE uses 2-step RedCap RA resources when 2-step eRedCap RA resources are not configured. If this is agreeable to RAN1, RAN2 will specify that an eRedCap UE that falls back from 2-step random access (using the 2-step eRedCap RA resources) shall use the 4-step eRedCap RA resources. |

RAN1 has made the following earlier agreements:

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| Agreements:* A network-configurable additional separate early indication in Msg1 for Rel-18 eRedCap UEs is supported.
	+ When Msg1 indication for Rel-18 eRedCap UEs is configured, it is used by Rel-18 eRedCap UEs (with or without UE BB bandwidth reduction).
* When Msg1 indication for Rel-18 eRedCap UEs is not configured while Msg1 indication for Rel-17 RedCap UEs is configured, Rel-18 eRedCap UEs shall share the PRACH that is configured for Rel-17 RedCap UEs.
	+ Note: Rel-18 eRedCap UEs will be differentiated from Rel-17 RedCap UEs based on Msg3 of Rel-18 eRedCap UEs.
* Additional early indication in MsgA PRACH is not supported.
* If MsgA PRACH early indication for Rel-17 RedCap UEs is configured, a Rel-18 eRedCap UE shall share the MsgA PRACH that is configured for Rel-17 RedCap UEs if the Rel-18 eRedCap UE performs 2-step RACH.
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RAN1 would like to make the following clarifications:

First, for the case when eRedCap 4-step RA resources are not configured, but RedCap 4-step RA resources and RedCap 2-step RA resources are configured, then both RedCap UEs and eRedCap UEs use RedCap 2-step RA resources for 2-step RA and use RedCap 4-step RA resources for 4-step RA including fallback from 2-step RA. RAN1’s understanding is that the LS from RAN2 does not concern this case, and that 2-step RACH will be supported for eRedCap UEs at least for this case.

Furthermore, from RAN1 point of view, fallback to RedCap 4-step RA resources can be supported for any case where an eRedCap UE uses RedCap 2-step RA resources for 2-step RA, under the assumption that gNB applies the eRedCap RAR timing relaxation for all RedCap UEs and eRedCap UEs when needed. If this approach is acceptable from RAN2 point of view, this means that all cases of 2-step RA for eRedCap UEs can be handled using RedCap 2-step RA resources with fallback to RedCap 4-step RA resources.

# 2 Actions

**To RAN2:**

**ACTION:** RAN1 respectfully requests RAN2 to take the above into account in their future work.

# 3 Dates of next TSG-RAN WG1 meetings

TSG-RAN WG1 Meeting #117 20th – 24th May 2024 Fukuoka, JP

TSG-RAN WG1 Meeting #118 19th – 23rd August 2024 Maastricht, NL